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BOROUGH OF LEICESTER.

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The Committee meet every Friday in the Committee Room, Town Hall, at 3-30 in the Afternoon.

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MRS. HARTSHORN.

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* Holds Certificate of the Sanitary Institute.

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LIBRARY

TOWN HALL, LEICESTER,

March, 1905.

The Chairman and Members of the Sanitary Committee.

Gentlemen,

I beg to present to you my Annual Report for the year 1904.

The birth-rate continues to decline and was the lowest on record.

The mortality rates for the Borough are again satisfactory. The zymotic death-rate was only 1·95 as compared with an average of 2·49 in the 76 large towns; and the general death-rate was only 14·56 as compared with 17·20 in the 76 towns.

In spite of the hot summer, and the consequently large number of deaths of infants from diarrhœa, the infantile death-rate was only very slightly above the average for the 76 towns, viz., 163 against 160.

As a striking illustration of the favourable position occupied by Leicester as compared with other towns of about the same size, I may mention that of the 33 great towns (having populations over 100,000) ONLY TWO *had a lower general death-rate than Leicester.*

Both Scarlet Fever and Diphtheria were less prevalent than usual during the year, and caused only ten deaths between them. The mortality from Scarlet Fever, indeed, was quite the smallest on record.

Typhoid Fever also was very much below the average.

The most unfavourable features of the year's statistics were the large number of deaths from pulmonary consumption, and the large number of deaths from diarrhœa. The latter disease was the subject of a special report which will be found appended.

I have also reported specially on the epidemic of Smallpox which prevailed during the year. The subject of Smallpox is of such peculiar interest in connection with your Borough that it seemed desirable to deal with it in some detail.

Another subject which has specially engaged attention during the year is the proposal to establish a Municipal Infants' Milk Depôt with the object of diminishing the large number of deaths amongst infants. A Sub-Committee has been appointed to consider the subject, and a special report is appended.

The Midwives' Act has now come into full operation and is referred to in the report.

I am, Gentlemen,

Your obedient Servant,

C. Killick Millard

Medical Officer of Health.

SUMMARY OF STATISTICS

FOR THE YEAR 1904.

Population (estimated) at Mid-year	224,186

Population at Census, 1901, 211,581.

Marriages	1,845
Marriage-rate	16·46
Births...	5,981
Birth-rate (lowest recorded)	26·67
Deaths	3,266
Death-rate (recorded)	14·56

Average for previous 10 years, 16·44.

Death-rate, corrected for Age and Sex (to compare with other towns), 15·55.

Infant Mortality	163

Average for previous 10 years, 182.

Zymotic-rate	1·95

Average for previous 10 years, 2·57.

Diarrhœa-rate	1·29

76 LARGE TOWNS.

Average Death-rate	in 1904*	17·20
,, Zymotic Death-rate	,, ,, ...	2·49
,, Infant Mortality	,, ,, ...	160

* Taken from Registrar General's Annual Summary.

Area of Borough (in acres)	8,586
Rateable value (1st October, 1904)... ...	£1,051,640
Penny in £ produced	£3,876
Number of persons per Acre at Census, 1901 ...	24·6
,, ,, per House ,, ,, ...	4·6
,, ,, Inhabited Houses, Dec. 31st, 1904	49,043

Borough extended year 1891.

MEDICAL OFFICER'S REPORT,

1904.

PART I.

STATISTICAL.

POPULATION.

The population of the Borough for the year 1904, as estimated by the Registrar General, was **224,186**, representing an increase during the twelve months of 3914.

Owing to the somewhat depressed state of trade in the Borough, it is possible that the real increase of population has been somewhat smaller than the estimated one, but the census of 1901 is still sufficiently recent to make any error of this description, if it exists at all, too small to materially affect statistics.

The "natural" increase of population for the year, or excess of births over deaths, was 2715.

MARRIAGES.

The number of marriages solemnised during the year was 1845, or 60 more than in 1903.

The *Marriage-rate* was 16·46.

The marriages took place as under:

First Quarter of Year	303
Second ,, ,,	516
Third ,, ,,	528
Fourth ,, ,,	498
Total	1845

BIRTHS.

The number of births registered in the Borough during the year was **5981,** of which 3030 were males, and 2951 were females.

This number is 37 fewer than in the previous year, and is the smallest number since the year 1895, when, of course, the population was considerably smaller than it is now.

The *Birth-rate* was 26·67 per 1000, which is the lowest figure hitherto recorded, being a fraction lower than the rate for 1903 which was the lowest previously recorded.

Fortunately, in Leicester, as I have pointed out in previous reports, the reduction in the birth-rate is compensated for by the great reduction which has been effected in the death-rate, so that the excess of births over deaths is as great as it was 50 or 60 years ago, when the birth-rate reached the astonishing figure of over 35 per 1000.

The number of *Illegitimate Births* was 236, equal to 3·9 per cent of the total births.

DEATHS.

The total number of deaths registered in the Borough, after correcting for Public Institutions,* was **3266,** of which **1680** were of males, and **1586** of females.

The *Death-rate* was **14·56** per 1000 population, and the only year a lower rate has been reached was the previous year, 1903, when the rate was only 13·91 —the lowest on record. In view of the fact that the summer of 1904 was a hot one, and therefore predisposing to diarrhœa, whilst the summer of 1903 was a cold and wet one, the fact that the death-rate in 1904 was only 14·56 must be considered very satisfactory. Had the number of deaths from diarrhœa last year been as few as was the case in 1903, the general death-rate would have been only 13·87, or actually lower than was the case in 1903; so that the slight increase in the death-rate over that of 1903 is attributable entirely to the increased number of deaths from diarrhœa.

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* 70 deaths of inmates of the County Asylum and 17 of inmates of the Infirmary, not residents of Leicester, have been deducted; whilst 15 deaths of residents of Leicester at the Borough Isolation Hospital, which happens to be outside the Borough, have been added).

DEATH-RATES OF OTHER TOWNS.

In Table L., which appears in its present form for the first time, are shown the principal vital statistics of the thirty-three great towns. The towns have been arranged in the order of their corrected death-rates, and the very favourable position of Leicester is at once apparent. *Only two other towns—viz.*, Croydon and Wolverhampton—have a lower rate. Croydon, being largely a residential suburb of the Metropolis, can scarcely be compared with a purely industrial centre like Leicester, so that Leicester's position is certainly remarkable. For several years now Leicester has compared very favourably with most large manufacturing towns, but she has not hitherto been quite so high on the list as at present.

As regards the death-rates from most preventable diseases, Leicester compares favourably with other towns. Her mortality from phthisis, however, was very high, few of the towns having a higher rate for 1904.

ZYMOTIC MORTALITY.

The number of deaths due to the severe principal zymotic diseases was 438. These were caused as follows:—

Smallpox ...	..	...	4 deaths.
Measles ...	...	...	32 ,,
Scarlet Fever	...	...	4 ,,
Diphtheria ..	...	...	6 ,,
Whooping Cough	...	...	89 ,,
Typhoid Fever	...	...	14 ,,
Diarrhœa ...	...	...	289 ,,
	Total	...	438 ,,

As is usually the case, by far the largest number of deaths, were caused by diarrhœa, which disease, indeed, tends to "swamp" the other diseases. In spite of the number of deaths from diarrhœa, however, the zymotic rate was only 1·95, the average for the previous ten years being 2·57, and the corresponding rate for the 76 large towns in 1904 being 2·49.

This favourable rate, in spite of the hot summer of 1904 and the large number of deaths from diarrhœa, and in spite of an epidemic of Smallpox, is due to the very small number of deaths caused by any of the zymotic diseases, except diaarhœa and whooping cough.

WARD MORTALITY.

Table II. gives the relative mortality, based on the census population* of the various wards in the Borough. This is a table which always possesses a very sinister interest, on account of the terrible contrasts which the mortality rates in the different wards present.

Newton Ward, as usual, comes out worst, with 19·7 per 1000, or practically the same figure as last year, and St. Margaret's comes second with 17·8 per 1000. Wyggeston Ward, however, which generally comes out badly, comes out much better than usual with only 13·9.

At the other end of the scale we have West Humberstone with only 10·8 — the lowest rate of all the wards — followed closely by Knighton, 11·1, and Spinney Hill, 11·8.

As I have pointed out in previous reports, the explanation of the great difference in mortality manifested by different districts of a town is very largely a social one, and it would be a great mistake to regard such difference as correctly indicating the difference in healthiness of the various localities.

Poverty, and the evils too often associated with it, has a far greater influence over the death-rate than any difference of salubriousness existing between different districts in Leicester. Nevertheless, there can be no question that the outskirts of the town, where the air is purer, the ground cleaner, and where houses are more modern and better built, are very much healthier than the old, dirty, and crowded central districts.

INFANTILE MORTALITY IN THE DIFFERENT WARDS.

It is very desirable that we should know, not only the general mortality in the various wards, but also the infant mortality. Unfortunately, it is not possible to ascertain this unless we first know the number of births occurring in each ward, as infant mortality is calculated upon the births. Hitherto, this latter information has not been available, as the birth returns received by us from the Registrars are not classified according to wards. It is desirable, however, that the information should be obtained, and I hope to make arrangements whereby in future reports I shall be able to give both the birth-rate and infant mortality in each ward of the Borough.

INFANT MORTALITY.

The number of deaths of infants under one year of age was **974** as compared with 971 in 1903, with 981 in 1902, and with an average of 1171 in the ten previous years.

The *Infant Mortality* (per 1000 children born) was 162·9 as compared with 161·3 in 1903.

This figure is much higher than it need be, and there is reason to hope that in the future we shall succeed in bringing it lower. Nevertheless, it represents a very great improvement on the past, as is shown by the following figures :—

INFANT MORTALITY.

Five-Yearly Periods.	Average Infant Mortality.
1874—1878	210·4
1879—1883	199·5
1884—1888	212·8
1889—1893	209·2
1894—1898	190·3
1899—1903	172·9
1904 (one year)	**162·9**

A table such as the above must be very gratifying to those who for many years have laboured to improve the sanitary condition of the Borough, and who can compare Leicester as it is now with what it was in years gone by.

It is probable that in this greatly diminished infant mortality we have one cause at least (though possibly a minor one) of the diminished birth-rate. One of my predecessors, Dr. W. Johnson, in his Annual Report for the year 1879, wrote as follows: "It is certain that a great fatality among infants in any town will tend to raise the birth-rate, for the mothers who lose their infants early become in a short time pregnant again. From this fact I am disposed to regard the high birth-rate in Leicester as a natural consequence of the excessive infant mortality." In the year in question, the birth-rate for Leicester was 37·3, and the infant mortality was 187·0 (average for previous seven years was 213). During the 25 years which have since elapsed, the infant mortality has come down to 162·9, and the birth-rate has fallen to 27·3.

This certainly points to some relationship between a high birth-rate and a high infant mortality, though it may not be a constant one.

In the report referred to—viz., for the year 1879—Dr. Johnson gives a table showing the average infant mortality in the twenty largest towns. In this table, Leicester occupies the unenviable position of having the second highest rate, the only town with a higher rate being Liverpool. In 1904, on the other hand, Leicester had so far improved her position that of these same twenty towns no less than eleven had a higher infant mortality than Leicester, so that *in comparison with other large towns* it is no longer correct to say that infant mortality is very excessive in Leicester.

This is, of course, no reason whatever why our efforts should be relaxed. The infant mortality in Leicester is still *a very great deal higher than it should be*. For example, the rate in London last year was only 144, and in Bristol it was only 134.

DEATHS OF INFANTS, PRINCIPAL CAUSES.

	1901.	1902.	1903.	1904.
Atrophy, Inanition and Debility	194	179	162	180
Bronchitis and Pneumonia ...	167	146	146	81
Convulsions	130	108	103	87
Diphtheria	12	1	4	0
Diarrhœa and Enteritis	259	154	156	277
Gastritis and Diseases of Stomach	24	13	21	17
Heart Disease	20	17	29	11
Measles	6	29	12	11
Premature Birth and Atelectasis	136	154	167	115
Syphilis	3	10	9	5
Teething	13	10	10	16
Tubercular Disease	48	44	66	49
Violence	15	21	15	15
Whooping Cough	33	39	13	50
Other Causes	38	50	58	60
	1098	981	971	974
Number of Children Born ..	6169	6313	6018	5981

OVERLYING OF INFANTS.

During the year, 11 deaths of young children were found (after inquest) to be caused by accidental suffocation whilst in bed with their parents. Such deaths are very deplorable, and they have often been commented upon. It is sometimes urged, as the proper remedy, that all mothers should provide cots for their babies, and should not allow them to sleep in the same bed with themselves. There is, however, something to be said against this suggestion, and medical opinion is divided on the subject. It is open to question whether amongst the poor, and especially amongst the ignorant and careless poor, with whom these deaths from overlying are most apt to occur, an infant is not, on the whole, safer and better off in bed with its mother than if put to bed alone. Amongst the well-to-do, where well-appointed baby's cots can be provided, with their proper complement of warm bed-clothing, etc., a baby is no doubt better off sleeping alone, but the circumstances are very different amongst the poor who, too often, can ill afford sufficient bed-clothes even for their own beds. Sufficient warmth during the cold hours of night in winter time is all-important during the early months of life, and it may well be urged that the natural source of heat for the young of most animals is the maternal body. For this reason I hesitate to condemn the practice of poor mothers sleeping with their infants.

It is true that the number of deaths attributed to "overlying" is, in the aggregate, lamentably great, but many of these deaths should more properly be attributed to inebriety. It is easy to understand how such accidents may occur during the heavy sleep following the imbibition of alcohol.

Recently, a death from overlying occurred in the Manchester Maternity Hospital, and at the inquest the provision of separate cots for the babies in the institution was suggested. The medical staff of the hospital, however, having considered the suggestion, did not approve of it, and Sir W. J. Sinclair, Professor of Obstetics and Gynaecology at Victoria University, and Hon. Physician to the Maternity Hospital, stated that he and his colleagues had come to the conclusion "that the use of separate cots would be more dangerous to the infants than lying alongside the mothers, as the chief danger to the new-born with their low vitality arises from the difficulty of keeping them warm." (Letter to Manchester Press.)

INFANT MORTALITY IN TOWN AND COUNTRY.

The question of infant mortality is intimately bound up with the difference between town life and country life, for although poverty and ignorance exist in the country as well as in the town, statistics show, as is well known, that infant mortality is ever so much less in the country. If we wish to reduce infant mortality, therefore, we must direct our efforts *inter alia* towards approximating the conditions of life in our towns as far as possible to the conditions of the country. From the point of view of reducing infant mortality it is not so much a housing question, or even of ordinary sanitation. Both these questions are notoriously neglected in the country. It is a question of *density of popula-*

tion on a given area. The more thickly houses are concentrated on a given area of land, the greater, other things being equal, will be the infant mortality. Hence, the high infant mortality of our great towns and cities, and the low infant mortality of our villages.

TABLE I.

VITAL STATISTICS OF 33 GREAT TOWNS FOR 1904.

TOWNS.	Corrected Death-rate.	Birth-rate.	Deaths under one year per 1000 Births.	Death-rates per 1000 persons living from:—							
				Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Enteric Fever.	Diarrhœa.	Phthisis.
Croydon ..	14·20	26·10	129	0·00	0·43	0·06	0·17	0·10	0·03	1·04	0·98
Wolverhampton	15·29	29·80	152	0·00	0·00	0·14	0·18	0·61	0·12	1·65	0·90
Leicester ...	**15·55**	**26·67**	**163**	**0·02**	**0·14**	**0·02**	**0·03**	**0·40**	**0·06**	**1·31**	**1·57**
Bristol . ..	15·86	26·05	133	0·002	0·26	0·10	0·30	0·30	0·04	0·51	1·19
Brighton ...	16·30	23·5	133	0·00	0·74	0·01	0·13	0·28	0·06	0·43	1·36
Derby	16·33	27·25	143	0·03	0·13	0·04	0·25	0·24	0·05	0·68	1·01
Cardiff	16·55	29·50	144	0·005	0·36	0·14	0·17	0·34	0·05	0·72	1·36
Halifax ...	16·60	20·10	130	0·08	0·41	0·21	0·15	0·17	0·09	0·34	1·20
London ...	17·00	28·00	144	0·01	0·49	0·08	0·16	0·32	0·06	1·04	1·63
Portsmouth ...	17·31	28·27	145	0·00	0·00	0·11	0·36	0·38	0·17	1·08	Not given.
Norwich ...	17·40	27·6	181	0·00	1·10	0·01	0·08	0·33	0·12	1·18	1·4
West Ham ..	17·91	32·16	165	0·00	0·58	0·13	0·14	0·35	0·11	2·08	1·40
Sheffield	18·14	31·99	159	0·002	0·07	0·20	0·12	0·35	0·12	1·35	1·24
Hull	18·20	30·80	181	0·00	0·70	0·00	0·20	0·20	0·10	20·8	1·20

Plymouth ...	18·21	25·33	173	0·00	0·70	0·31	0·11	0·24	0·15	1·02	Not given.
Nottingham ...	18·40	27·80	175	0·05	0·18	0·11	0·28	0·35	0·23	1·37	1·31
Huddersfield ...	18·81	23·71	136	0·01	0·79	0·11	0·15	0·26	0·07	0·51	1·33
Swansea ..	18·90	30·50	172	0·00	0·00	0·14	0·24	0·99	0·05	0·77	1·46
Bolton	19·12	26·90	167	0·005	0·09	0·12	0·16	0·76	0·21	0·94	1·25
Bradford ...	19·39	22·02	166	0·01	0·53	0·12	0·53	0·19	0·14	0·83	0·38
Blackburn ...	19·40	23·50	191	0·00	0·45	0·09	0·08	0·72	0·15	0·81	0·94
Gateshead ...	19·50	34·4	174	0·02	0·55	0·18	1·12	0·45	0·14	1·11	Not given.
Preston ...	19·52	28·26	183	0·05	0·74	0·06	0·18	0·25	0·25	1·43	1·06
Leeds	19·56	28·00	176	0·00	0·77	0·13	0·11	0·46	0·10	0·99	1·40
Burnley ...	20·00	27·25	232	0·00	1·01	0·012	0·02	0·043	0·019	2·01	1·51
Sunderland ...	20·00	34·40	165	0·01	0·38	00·2	0·17	0·42	0·22	1·09	1·37
Oldham ...	20·60	24·90	155	0·10	0·50	0·16	0·24	0·26	0·16	0·91	1·38
Birmingham ...	20·80	31·50	195	0·00	0·39	0.12	0·21	0·87	0·07	1·76	1·50
Newcastle ...	20·92	30·5	156	0·01	0·48	0·14	0·16	0·45	0·14	0·78	Not given.
Birkenhead ...	21·20	33·14	Not given.	0·008	0·85	0·17	0·17	0·72	0·11	1·54	1·51
Salford ..	23·22	31·70	193	0·01	1·10	0·24	0·50	0·60	0·20	1·66	1·97
Liverpool ...	23·40	33·50	196	0·0027	0·96	0·20	0·27	0·58	0·11	2·52	1·70
Manchester ...	23·79	31·3	187	0·01	0·76	0·22	0·19	0·50	0·18	1·34	Not given.

The figures in the above tables are liable to correction. They have been taken chiefly from the tables published in *Public Health* from Returns sent in by the different towns.

TABLE I. (a).

SUMMARY OF VITAL STATISTICS FOR ENGLAND AND WALES IN 1904.

Annual Birth-rates and Death-rates from the seven chief Epidemic Diseases in England and Wales during 1904.

	Annual Rates per 1000 Living.			Infant Mortality.
	Births.	Deaths from all Causes.	Deaths from seven chief Epidemic Diseases.	Deaths under one year per 1000 Births.
England and Wales	27.9	16·2	1·94	146
76 Great Towns	29·1	17·2	2·49	160
142 Smaller Towns	27·5	15·6	2·02	154
England and Wales, less the 218 Towns ... ... (Rural England and Wales.)	26·7	15·3	1·28	125

From Table F., Registrar General's Annual Summary.

TABLE II.

WARD MORTALITY, 1902 TO 1904.

Ward.	Population Census, 1901.	Death rate, 1902.	Death-rate, 1903.	Death rate, 1904.
†1. West Humberstone ...	15,717	13·5	11·8	10·8
2. Knighton	10,221	9·2	9·8	11·1
3. Spinney Hill	21,279	12·9	11·4	11·8
4. Westcotes	16,752	11·4	12·0	12·7
5. De Montfort	7,907	11·7	10·7	12·8
‡6. Wycliffe	11,810	14·5	13·2	13·0
7. The Castle	14,384	12·8	11·9	13·8
8. St. Martin's	3,791	12·3	10·8	13·9
9. Wyggeston	15,890	17·8	17·8	13·9
10. The Abbey	18,116	15·8	12·9	14·1
11. Belgrave	13,849	14·0	12·6	14·6
12. Charnwood	9,084	11·7	14·6	15·1
13. Aylestone	9,860	13·8	14·4	15·5
14. Latimer	17,275	16·9	14·1	15·6
15. St. Margaret's ...	12,639	14·7	15·6	17·8
16. Newton	10,330	18·5	19·5	19·7
Whole Borough ...	211,581	14·6	13·9	14·5

Exclusive of the deaths of persons removed to and dying at the Union Workhouse and Borough Asylum. Other institution deaths distributed to their respective wards. The rates have been calculated on the census population of each ward. During 1904 there were 292 deaths at the Workhouse and 61 at the Borough Asylum.

† This ward includes Borough Asylum, but deaths at this Institution have been subtracted.

‡ This ward includes Workhouse, but deaths at this Institution have been subtracted.

PART II.

ZYMOTIC DISEASES, &c.

SMALLPOX.

As this disease was epidemic during 1904, I have again made it the subject of a special report, which is appended to the present report. It is therefore unnecessary to refer to it further.

VACCINATION.

Below is the usual table (No. III.), giving the number of primary vaccinations, public and private, registered in Leicester during 1904 and previous years.

The amount of vaccination performed in Leicester rose considerably in 1902 and 1903, leaping up from 357 in 1901 to 1237 in 1902, and to 2487 in 1903. This increase was, of course, mainly due to the presence of Smallpox in the Borough. It is sometimes stated that "the more vaccination, the more Smallpox." In reality the statement should be "The more Smallpox, the more vaccination," for whatever views may be held about vaccination it cannot be denied that the presence of Smallpox in a community induces many people to get vaccinated who otherwise would not have been done.

In 1904 the number of primary vaccinations was 1282, a substantial reduction on the figures for the previous year. This is accounted for by the fact that although 1904 was an epidemic year for Smallpox, and the total number of cases which occurred was not much less than the number in 1903, yet the disease attracted much less attention and caused less alarm. For one thing, the public had become comparatively accustomed to the presence of the disease. Moreover its exceptionally favourable type also tended to allay alarm.

It will be interesting to see how far the number of vaccinations returns to its old level when the disease entirely leaves the town.

The subject of vaccination is dealt with more fully in my special Smallpox report.

VACCINATIONS REGISTERED IN 1904.

	Public.	Private.	Total.
1st quarter ...	185	113	298
2nd ,, ...	354	192	546
3rd ,, ...	125	128	253
4th ,, ...	89	96	185
Total ...	753	529	1282

TABLE III.

PRIMARY VACCINATIONS REGISTERED IN LEICESTER, 1881–1904.

PRIMARY VACCINATIONS.				Total Number of Births.
Year.	Public.	Private.	Total.	
1881	1,998	1,419	3,417	4,860
1882	1,710	1,396	3,106	4,856
1883	1,203	755	1,958	4,787
1884	994	769	1,763	4,921
1885	908	934	1,842	4,652
1886	611	511	1,122	4,857
1887	196	275	471	4,679
1888	72	242	314	4,787
1889	27	145	172	4,789
1890	12	119	131	4,699
1891	6	86	92	4,790
1892	12	121	133	5,816
1893	44	205	249	6,006
1894	29	104	133	5,995
1895	12	63	75	5,692
1896	19	67	86	6,212
1897	11	70	81	6,252
1898	12	80	92	6,152
1899	56	100	156	6,273
1900	155	188	343	6,207
1901	148	209	357	6,169
1902	770	467	1,237	6,313
1903	1,859	628	2,487	6,018
1904	753	529	1,232	5981

SCARLET FEVER.

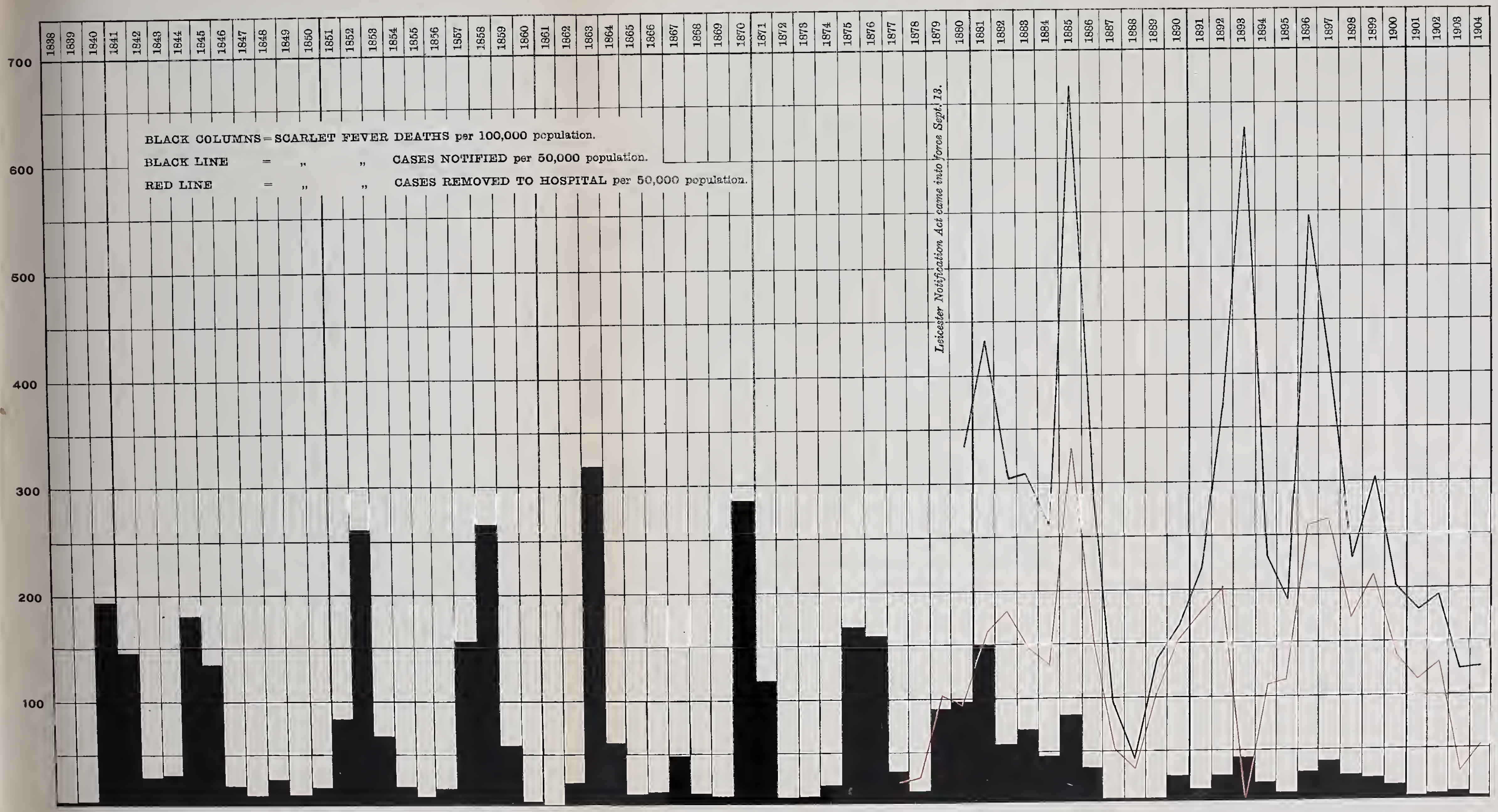
The number of cases of this disease reported during 1904 was only 554, and the number of deaths was only *four*.

This represents a fatality of *less than one per cent* of the cases. In proportion to population this is the smallest number of deaths on record, whilst the fatality is very much lower than anything previously recorded.

As I have pointed out in previous reports, Scarlet Fever is now a very different disease to what it formerly was. Some twenty or thirty years ago the disease was a scourge, not infrequently carrying off, at a single visitation, several members of the same family. Sir Thomas Watson, many years ago, in his *Practice of Physic*, described Scarlet Fever as "far the most terrifying and deadly of all the exanthematous group." Since then the fatality of the disease has declined to such an extent that at the present day it is little if any more dangerous to life than is Measles. Moreover, the complications and sequelæ of the disease are now, fortunately, much less common and less serious in their effects than used to be the case.

This change for the better in the character or *type* of the disease has not been confined to particular towns or even to this country, but has been observed in other European countries and in America. It cannot be ascribed, therefore, to any localised cause, or to any particular measures which here and there may have been directed against it. To what it is really due we cannot at present say. We only know that alterations in type, extending over a wide cycle of years, have been observed in the case of other zymotic diseases. Diphtheria and Smallpox are examples of this, though in the latter disease the phenomenon has been obscured, in the last century at least, by the introduction of the practice of vaccination. In Diphtheria, however, we have evidence of a disease diminishing in virulence for a number of years, and then greatly increasing in severity, as was the case in Leicester a few years ago. It may be that we shall witness in future years a similar exaltation of virulence in Scarlet Fever also, but fortunately there is no indication of such a change at present. It is clear, however, that the fatality of the

DIAGRAM.—*Scarlet Fever in Leicester, 1838-1904.*



disease, in Leicester at least, (which last year, as we have seen, was less than one per cent.) cannot fall much lower.

As regards the prevalence of the disease, we must expect, judging from past experience, that it will soon increase, for it has now been below the average for several years.

The accompanying diagram shows in graphic form the *mortality* (proportion of deaths to population) from Scarlet Fever in Leicester from the year 1838 (the earliest year for which we have records), while from the year 1880 the number of *cases* reported and the number of cases removed to hospital (in proportion to population) are also shown. Unfortunately we have no record for the earlier years, prior to the days of notification, of the number of cases occurring, and it is impossible, therefore, to compare the fatality of the diseases at that time with more recent years.

EXPERIENCE OF THE DISEASE IN 1904.

In April, owing to the epidemic of Smallpox, which for a few weeks assumed serious proportions, it was found necessary to utilise the Groby-road Isolation Hospital solely for that disease. This necessity having been anticipated, there were only a very few patients remaining in the hospital, and these were sent home. For three months, April, May and June, no Scarlet Fever patients* could be removed to hospital. Fortunately, however, no increase in the prevalence of the disease occurred. The same happy experience was noted, it will be remembered, when the Fever Hospital had to be closed to Scarlet Fever on account of Smallpox in 1903, and on that occasion practically no Scarlet Fever cases were admitted for six months.

During the total of nine months (in 1903 and 1904) that cases of Scarlet Fever had to be treated at home, 316 cases of the disease were reported, exclusive of cases in public institutions. A careful record was kept of these, with the special object of ascertaining the number of instances in which the first case in a house led to one or more of the other inmates developing the disease.

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* Towards the end of this period six cases were removed from a Boarding School in the town.

I found that the 316 cases occurred in 285 different houses: that in 259 of these houses, or in 91 per cent., no spread of infection occurred to the other inmates, only the one case occurring. In the remaining 26 houses 31 secondary cases occurred: that is to say, that only in 9 per cent. of the infected houses did any of the other inmates contract the disease. Such a result was very satisfactory, and I believe it will compare not unfavourably with the results usually obtained by hospital isolation.

It is right to point out, however, that at times when Scarlet Fever is non-epidemic, as was the case during the periods under consideration, the disease appears to be very much less infectious than during epidemic periods. I have noticed the same thing in the case of other diseases, *e.g.*, in diphtheria.

SCARLET FEVER AND HOSPITAL ISOLATION.

My views on the question of hospital isolation for this disease being well known, I will only refer to the subject very briefly. I think I may claim that an increasing number of sanitarians are largely modifying their views on this question, and it is now generally admitted that hospital isolation, as regards this disease, has signally failed to fulfill the sanguine expectations of its early advocates.

It is coming to be recognised that a full and authoritative inquiry is urgently called for, and there can be no doubt that the medical department of the Local Government Board is the authority who ought to undertake the task. It is surprising, indeed, in view of the enormous importance of the subject from the ratepayers' point of view, and of the widespread uncertainty and difference of opinion which exists, that a full inquiry should have been so long delayed.

Personally, I believe that the day is not far distant when the comparative inutility of isolating this disease in hospital, otherwise than in exceptional cases, will come to be officially recognised, and the policy of the country generally will then have to be modified.

It is of interest in this connection to observe that Captain O'Connor, Medical Officer of Health for the Leicestershire and Rutland Combined Sanitary Districts, deals very fully with this question in his annual report for the Blaby Rural District. Blaby has had a fever hospital in operation for the past ten years, and Captain O'Connor gives statistics for these ten years for the ten largest villages in the Blaby District. From these it appears that five of these villages have patronised the hospital very much more than the other five (66 per cent. of the cases having been removed to hospital, as against only 14 per cent). He discovers, however, the disquieting fact that during the ten years in question there has been *more than twice as much Scarlet Fever* in the group of villages which has used the hospital most!

As a consequence of this startling result Captain O'Connor comes to the following conclusion :—"I must, in the interest of the public health, advise home isolation in a large proportion of future cases."

Unfortunately, the results of hospital isolation in other districts in the county would also appear to be unsatisfactory.

I would point out that the results of such a measure as hospital isolation can be much more accurately and readily gauged in a rural district than in a large town or city, because in the former the population is distributed into separate units (villages), each comparatively isolated, and of known population. These villages can fairly be compared with one another as to the extent to which they have resorted to hospital isolation and as to the subsequent prevalence of disease. In towns, on the other hand, it is impossible so to compare one street with another street. For this reason it is probable that an exhaustive inquiry into the results of hospital isolation in rural districts might throw much light on this important and burning question.

DIPHTHERIA.

My report as regards this dreaded disease must be regarded as very satisfactory. During the year only 97 cases were reported, whilst the number of deaths caused by it was only six.

This is by far the smallest number of either cases or deaths for several years. The serious epidemic which invaded the town five years ago, and which resulted in such a deplorable loss of life, reached its zenith in the year 1900. Since then the disease has progressively declined, as is shown in the following table:—

Year.	Cases.*	Deaths.
1895	75	36
1896	170	53
1897	229	73
1898	218	63
1899	892	222
1900	1452	316
1901	1034	155
1902	320	29
1903	211	28
1904	97	6

The decline in the number of deaths is even more noteworthy than the decline in the number of cases. Six deaths in a population of 224,000 represents a mortality of only ·026 per 1000, and it is over thirty years since such a low mortality as this was recorded. This favourable result is largely due to the fact that the disease was, generally, of a mild type, contrasting with the severe type experienced a few years ago.

The number of cases removed to the isolation hospital was 26, and although many of the cases were sent to hospital because they were severe cases—in several instances necessitating immediate operation—I am pleased to state that only one of the cases died. This is eminently satisfactory, and reflects great credit upon Dr. Warner and the nursing staff at the hospital.

Rather a striking feature of the disease during the year was its apparently very slight infectiousness as compared with some previous years. This was shown by the few instances in which the disease spread to other members of the same family. In 71 of the cases the patient was not removed to hospital, yet only in two instances was another member of the household attacked by the disease.

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* The number of cases reported in former years was only an approximate indication of the real number that occurred, as the diagnosis of this disease was less accurate than is now the case.

TYPHOID FEVER.

In this disease also the experience of 1904 was very favourable. The number of cases reported was 64, which, with the exception of the year 1903, is the lowest on record since notification came into force. The number of deaths was 14.

As I pointed out in my report for 1903, Typhoid Fever in Leicester has been on the decline for several years, and as the prevalence of this disease is usually regarded as an index of the general sanitary condition of a town, this fact must be regarded as very gratifying testimony to the past efforts of the Sanitary Committee.

Below are the figures for the past ten years :—

1895	... ...	248 cases.
1896	... ...	283 ,,
1897	... ...	215 ,,
1898	... ...	237 ,,
1899	... ...	162 ,,
1900	... ...	117 ,,
1901	... ...	126 ,,
1902	... ...	81 ,,
1903	... ...	58 ,,
1904	... ...	64 ,,

The number of cases occurring in 1904 would have been considerably less but for two localised outbreaks occurring in two houses, in one of which four cases occurred, and in the other no less than eight. Both these outbreaks were traced to a similar cause. In each house the first case which occurred was not typical of typhoid, and was not recognised as that disease, and therefore no precautions were taken. Both families were large, each consisting of father and mother with eight and ten children respectively. The result was disastrous. Eleven other persons in the two houses caught the disease.

We have several times observed this tendency of Typhoid Fever to spread in a house where the nature of the first case has not been recognised. There is no question that this disease, contrary to the view that was at one time held, may, under certain circumstances, readily spread by direct infection from person to person.

Hospital treatment in the case of Typhoid Fever occurring in a working-class home is often most desirable. The disease is one which calls for highly skilled nursing and attendance, besides being, as we have said, sometimes very infectious. In many cases, indeed, it would really be out of the question to treat cases in their own homes. For this reason I incline to the view that hospital isolation and treatment is more important in Typhoid Fever than is any other disease except Smallpox.

During the year 37 cases, or a little over 50 per cent., were removed to the Borough Isolation Hospital, and six of these proved fatal.

MEASLES.

The year 1904 was also a favourable one as regards Measles. The number of deaths caused by it was only 32, as compared with 74 in 1903, and with an average of 77 in the previous ten years.

Unfortunately, however, the year 1905, in which we now are, seems likely to be an epidemic year for this disease, and during the first quarter alone the number of deaths has equalled those for the whole of 1904.

Deplorable as the mortality from Measles still is, there is evidence, fortunately, that in Leicester it is distinctly tending to decline. This is shown by the following figures, giving the average mortality in successive quinquennia during the last twenty-five years:—

MEASLES.

Period.				Mortality per 1000.
1880—1884	...	...	...	·514
1885—1889	...	..	...	·446
1890—1894	...	...	...	·443
1895—1899	...	...	...	·406
1900—1904	...	...	...	·226

As to the causes that have brought about this satisfactory decline—obviously it cannot be attributed to hospital isolation, to notification, or to vaccination. In the absence of more definite knowledge, we are justified, perhaps, in attributing it to improved "environment"—*i.e.*, to better surroundings and conditions of living generally, and it is probable, I think, that this same influence has also helped to reduce the mortality from Scarlet Fever, from Smallpox, and from Typhoid Fever.

There is reason then to hope that as sanitation progresses, using the term in its broadest sense, the mortality from these diseases, and others also, will further decline.

WHOOPING COUGH.

This disease caused 89 deaths, which is rather above the average. Fifty of the deaths were in infants. As is well known, Whooping Cough is rarely fatal except in very young children. Only 3 out of the 89 deaths were in children above the age of 5 years.

PUERPERAL FEVER.

Probably no class of deaths are more sad than those which arise in connection with child-birth. The victims are usually in the prime of life, and often leave a family of young children behind them.

Puerperal Fever deaths are especially regretable, because these deaths must, to a large extent, be regarded as preventable.

It would, however, be an injustice to assume that every case of Puerperal Fever could have been prevented, or that whenever a case does occur someone is necessarily to blame. Cases do sometimes occur in the practice of the most careful medical men, or in the best managed institutions, though fortunately they are rare.

The number of cases notified as Puerperal Fever in Leicester during 1904 was 16, and of these five proved fatal.

Seven further deaths were caused by other accidents of parturition, making a total of twelve deaths in connection with child-birth. As nearly 6,000 children were born during the year (exclusive of still-births) these figures are certainly satisfactory. The corresponding totals for the two previous years were: 1902, 17 deaths: 1903, 14 deaths.

Every case of Puerperal Fever is investigated, and if attended by a Midwife the latter is interviewed by the Medical Officer of Health, and directions given as to the precautions as to disinfection, &c., to be observed. Fortunately it very rarely indeed happens that more than a single and isolated case occurs in the practice of the same midwife. In December of the year under review, however, and in January, 1905, a series of these cases did occur in the space of about six weeks in the practice of the same midwife.

In this instance special measures had to be taken. The midwife was stopped from attending further cases for nearly three weeks. Her clothing and midwifery bag were disinfected: the house was stoved and partly re-papered: and she herself was taken to the Borough Hospital to be bathed.

As it was found on investigation that the midwife had failed to send at once for medical aid, as required by the regulations of the Central Midwives' Board, on the first appearance of unfavourable symptoms in the cases in question, she was summoned before the Sanitary Committee and reprimanded.

THE MIDWIVES ACT, 1902.

This Act came into force on April 1st, 1903, but it was not until 1904 that much could be done to give it effect.

The object of the Act is to secure the better training of Midwives and to regulate their practice. After the 31st March, 1905, only Registered Midwives may use the title of Midwife, and after 31st March, 1910, no woman shall "habitually and for gain" practice as a midwife, unless she be registered as a midwife.

In order to get registered in future, a proper course of instruction must be attended, and an examination passed in accordance with the regulations drawn up by the Central Midwives Board.

A temporary provision was made, however, whereby existing midwives who have been in *bonâ fide* practice since July, 1900, can get registered without examination, on producing a certificate of good character, and paying a fee of ten shillings. No question is raised as to their efficiency or suitability for the profession of midwife.

This provision was only available until April 1st, 1905. After that date existing midwives, if they have not already registered, can only do so by undergoing training and passing the examination.

The number of existing midwives who have availed themselves of this provision, and have been placed upon the Roll of Midwives, is (up to April 1st, 1905), 43. This represents, I believe, very nearly all the existing midwives in Leicester: only a few aged or infirm midwives, and a few who were scarcely practising at all, having failed to register. Of the 43 who have registered, seven hold the certificate of the London Obstetrical Society, and may therefore be regarded of having been trained. The suitability of the remainder varies. Some appear to be intelligent women, careful in their methods, neat and tidy in their persons, and fairly well educated, but others certainly cannot be so described.

The Midwives Act, the execution of which has been devolved by the Town Council upon the Sanitary Committee, lays new and very responsible duties upon that committee, and upon the official charged with its administration. It will increase the duties of the Medical Officer of Health very considerably.

The following are the duties of the "Local Supervising Authority," as laid down in Section 8 of the Act :—

(1) To exercise general supervision over all midwives practising within their area in accordance with the rules to be laid down under this Act.

(2) To investigate charges of malpractice, negligence, or misconduct, on the part of any midwife practising within their area, and should a *primâ facie* case be established, to report the same to the Central Midwives Board.

(3) To suspend any midwife from practice, in accordance

with the rules under this Act, if such suspension appears necessary in order to prevent the spread of infection.

(4) To report at once to the said Board the name of any midwife practising in their area convicted of an offence.

(5) During the month of January of each year to supply the Secretary of the Central Midwives Board with the names and addresses of all midwives who, during the preceding year, have notified their intention to practise within their area, and to keep a current copy of the roll of midwives, accessible at all reasonable times for public inspection.

(6) To report at once to the Central Midwives Board the death of any midwife or any change in the name or address of any midwife in their area, so that the necessary alteration may be made in the roll.

(7) To give due notice of the effect of the Act, so far as practicable, to persons at present using the title of midwife.

In addition to the above, Rule 20 of the Regulations made by the Central Midwives Board, reads as follows:—

"The supervising authority shall make arrangements to "secure a proper inspection of every midwife's case-book, bag and "appliances, &c., and, when thought necessary, an inspection of "her place of residence, and an investigation of her mode of "practice."

In some large towns and counties special officers are being appointed, usually under the Medical Officer of Health, to carry out this duty.

During the past year I personally visited each registered midwife at her own home, in compliance with this rule, inquired into her method of practice, and inspected her house, midwifery bag and case-book. In many cases deficiencies were found and pointed out.

THE TRAINING OF MIDWIVES.

The Midwives' Act states in the pre-amble that it is an Act to secure the better training of Midwives, but no provision whatever is made in the Act for providing facilities for training.

Yet it is clear that, if in the future only women who have undergone a special course of training are to be allowed to register as midwives, there is likely to be a serious shortage in the supply of midwives unless special facilities for training be provided. In some of the larger centres, therefore, steps are now being taken with the object of providing such training. In Leicester a Ladies' Committee was formed for this purpose and a fund was raised. Arrangements have now been made whereby the Leicester Provident Dispensary (a very large and well-organised body) should undertake, in conjunction with this Committee, to provide a systematic course of training to be approved by the Central Midwives' Board. As part of the scheme, a small cottage maternity hospital, containing four beds, is to be opened, which will be in charge of a Matron who will herself be a fully trained and qualified midwife and capable of training others. Lectures and demonstrations will be given by medical men appointed for the purpose.

The Leicestershire County Council have agreed to assist the scheme by providing a number of scholarships for suitable women from the county who wish to be trained, and it is hoped that the Corporation of Leicester will be able to make a similar offer.

DIARRHŒA.

This disease was the subject of a special report, which will be found appended. It is therefore unnecessary to refer to it further.

The number of deaths during the year was 275.

PHTHISIS.

(PULMONARY CONSUMPTION).

The number of deaths caused by this disease was no less than 353, including under the term "phthisis" all forms of tubercular disease of the lungs.

This number is a very serious increase on previous years, and I regard it as the most unfavourable feature in the year's statistics. In Table I. will be found the Phthisis mortality in the other great towns, and from this it appears that during the past year Leicester compares unfavourably with most of them.

It is sincerely to be hoped, of course, that this increased mortality is only accidental, but it must certainly cause serious misgiving. There is no disease at the present day causing more wide-spread ravages or inflicting more economic loss upon the nation than does consumption. Cancer is also a terrible disease, and possibly more dreaded, but its victims are largely drawn from persons past the prime of life. Consumption, on the other hand, too often attacks young adults and persons still in their prime—frequently with young families dependent upon them.

For these reasons it behoves us to spare no efforts or expense in endeavouring to combat the disease and reduce its prevalence.

OCCUPATIONS OF PERSONS DYING FROM PHTHISIS.

This is shown in Table IV. As usual, the number of deaths of persons employed in the Shoe Trade is much larger than in other trades, but this is only what we should expect from the position of the shoe industry in the town. As regards the Hosiery Trade, the true number of deaths is obscured, as so much of the work is done by married women (both in the factory and at home), and in these cases the occupation is not usually stated in the death returns.

As regards the different departments of the Shoe Trade, "finishers" again head the list. From the dusty nature of the operation of "finishing" it would be easy to understand how this kind of work should pre-dispose to the disease by the irritating effect of the dust upon the lungs. In order to ascertain the conditions under which the men work, I have visited a large number of the factories and workshops in the town. It appears that not very much of this work is now done in workshops, as used to be the case, the large modern factory having taken their place. I find that in practically all the shoe factories I have visited the "finishing" machines are provided with special appliances for removing the dust immediately it is produced. Even, however, when these are working satisfactorily (which is not always the case), a little of the dust is apt to escape. How far this dust in small quantities is really injurious I am not yet prepared definitely to say, but it cannot be beneficial. It will be noticed (Table IV.) that during the year, 19 out of the 45 deaths of men over 20 working in the shoe trade were "finishers." This is equivalent to 41 per cent., but from information furnished to me in certain large and representative factories it would appear that the proportion of men actually employed at this class of work is not quite so great as this. I hope, however, to obtain further and more extensive figures on this point. In the meantime, it is certainly to be desired that the ventilation in all factories and workshops should be kept as efficient, and the atmosphere as pure, as possible. Judging from observation, I am of opinion that deficient ventilation generally arises from objections on the part of some of the employees to having the windows or ventilators open. In the hope of encouraging the workpeople themselves to attend to this matter, which, of course, essentially concerns them, a notice is about to be issued to workshops and factories, calling their attention to it. At the same time the attention of the employers will also be drawn to the importance of the subject.

THE FAMILY HISTORY OF PHTHISIS PATIENTS.

Amongst the details inquired into by the Sanitary Inspectress when visiting cases of consumption notified to us, are particulars as to the family history of the sufferer in regard to this disease. In a very large proportion of the cases there is a history of other members of the family or household having also suffered from the disease. The information gathered during the year may be summarised as follows:—

In 33 instances, a father or mother of patient had suffered;

In 13 instances, an uncle or aunt of patient had suffered;

In 43 instances, a brother or sister (in 6 of these more than one brother or sister had suffered);

In 18 instances, a child of patient had suffered;

In 12 instances, another member of the household (not related to patient) had suffered;

In 69 instances, no history of consumption in family or house was known.

(The above occurred amongst 176 cases investigated.)

In other words, in over 60 per cent. of the cases there was a history of other members of the family or household having already been attacked by this fell disease! How far these figures should be taken as indicating an inherited tendency to consumption is a debated point. The more modern view is that very many, if not most, of the cases should be regarded as having occurred through direct infection from one person to another living in the same house. Evidence is accumulating to support this view, but there is no doubt that a constitutional weakness or special tendency to consumption often is inherited, though actual infection afterwards is necessary before the disease can develop.

DEATHS FROM PHTHISIS IN THE DIFFERENT WARDS.

This is shown in Table V., and also the average mortality per 1000 population for the past ten years. In making a comparison between the different wards, however, it is important to bear in mind the fact that from some of the wards, *e.g.*, Newton and St. Margaret's or Wyggeston, the inhabitants of which are mostly very poor, a large proportion of the persons attacked by consumption end their days in the Workhouse, and do not actually die in the ward to which they properly belong. But for this, it is certain that the mortality-rate from Phthisis in the poorer wards of the town would come out higher than it does.*

HOSPITAL ISOLATION FOR CONSUMPTIVES.

The experiment begun at the end of 1903 has been continued. The subject is dealt with later in the Hospital Report. I will only say that whilst it is easy to over-estimate the possibilities of sanatorium treatment, I still believe that good work is being done. Very many of the cases we have to deal with only apply for treatment when the disease is altogether too far advanced to expect permanent benefit from sanatorium treatment. Others, on leaving the hospital greatly benefited, have to return to their old life and occupation, and too often relapse. In these respects, as in others, we have the same difficulties and disappointments that are experienced by sanatoria for the working-classes elsewhere. Of one thing there is no doubt, and that is that the admission of consumptives to the Groby Road Hospital is an enormous boon to the great majority of those who go there, and it certainly *prolongs* life in almost every case. We have a large number of applications for re-admission, which on principle we have to refuse. Were we not to do so, almost all would want to come back. Hitherto, cases are only admitted for one month, though special cases are, with the approval of the Committee, allowed to stay on for a second month if the accommodation permits.

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* It would be an advantage if the deaths which takes place in the Workhouse could be allocated to their respective wards. At present, however, I am unable to make this correction.

TABLE IV.

Age Distribution of Deaths from Phthisis in 1904.

Age Period.	Males.	Females.	Total.
0 to 5	10	8	18
5 ,, 20	25	16	41
20 ,, 40	94	74	168
40 ,, 60	78	39	117
Over 60	6	3	9
Total	213	140	353

Occupation followed by those Dying from Phthisis.

	Males.		Females.	
SHOE TRADE:	Under 20.	Over 20.	Under 20.	Over 20.
Finishers	3	19	...	...
Rivetters	3	13	...	...
Clickers	2	10	...	...
Shoe Hands	...	2	2	1
Machinists	...	...	4	3
Fitters	..	...	2	...
Pressman	...	1	...	...
Total	8	45	8	4

Clerks	7
Hosiery Hands	10
Framework Knitters	3
Labourers	6
Tailors	5
Hosiery Countermen	4
Engine Fitters	3
Elastic Web Weavers	5
Horsekeepers	2
Dressmakers	2
Bakers	2
Box Makers	2
Stonemasons	2
Commercial Travellers	2
Worsted Spinners	2
Porters	3
Cigar Makers	2
Soldiers	2
Vanmen	2
Various (one example of each)	51
Occupation not stated (chiefly Children and Married Women):	
Males	43
Females	128

TABLE V.

Deaths in each Ward from Phthisis during the Ten Years, 1895 to 1904.

No. of Ward.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	Total Deaths from Phthisis in 10 years.	Average Annual Mortality.
1. St. Martin's ...	8	4	4	8	1	2	0	3	6	7	43	1·05
2. Newton	10	10	15	7	7	27	21	5	7	18	127	1·16
3. St. Margaret's ..	9	11	12	17	17	22	6	17	21	27	159	1·18
4. Wyggeston ...	17	17	15	18	12	18	19	23	42	35	216	1·32
5. Latimer	16	24	15	24	14	18	31	19	26	35	222	1·27
6. Charnwood ..	16	9	14	9	10	7	8	6	10	16	105	1·10
7. Wycliffe	11	13	11	11	9	15	15	13	41	47	186	1·18
8. De Montfort ...	7	9	6	10	2	6	6	3	8	12	69	·75
9. The Castle ...	10	17	12	10	18	19	20	17	16	21	160	1·11
10. Westcotes	18	13	9	10	12	10	12	19	19	25	147	·83
11. The Abbey ...	3	7	6	9	18	21	21	17	14	19	135	·71
12. Belgrave	11	15	14	12	10	17	15	10	8	13	125	·86
13. West Humberstone	11	13	12	11	15	13	20	13	15	19	142	·89
14. Spinney Hill ...	7	19	17	19	15	18	25	25	22	25	192	·89
15. Knighton	3	7	5	9	4	6	9	19	6	10	78	.68
16. Aylestone	6	9	7	6	6	4	13	15	18	24	108	1·01
Workhouse	8	19	25	25	30	27	16	32	28	43	253	...
Borough Asylum ...	5	3	8	4	2	2	5	5	7	11	52	...
Infirmary	6	4	3	3	2	5	8	11	4	6	52	...
Total	182	223	210	222	204	257	270	272	318	413	2571	

TABLE VI.

Table showing the Number of Deaths from Tubercular Diseases in Leicester in the past Sixteen Years.

Year.	Phthisis.	Tabes Mesenterica	Tubercular Meningitis.	Other Tubercular Diseases.	Total Tubercular Deaths.	Deaths per 1000 Population living.
1904	353	8	78	10	449	2·0
1903	266	7	101	3	377	1·7
1902	272	9	77	0	358	1·6
1901	271	15	62	3†	351	1·6
1900	230	8	91	45	374	1·7
1899	202	18	81	30	331	1·5
1898	221	17	83	37	358	1·7
1897	215	16	73	44	348	1·7
1896	220	10	69	44	343	1·7
1895	189	21	80	40	330	1·7
1894	207	14	59	31	311	1·6
1893	250	17	83	40	390	2·1
*1892	216	21	65	38	340	1·8
1891	181	11	34	24	250	1·4
1890	197	15	26	29	267	1·7
1889	178	21	13	23	235	1·5

* The figures after the year 1891 refer to the extended Borough of Leicester.

† The apparent diminution in the number of deaths from "Other Tubercular Diseases" since 1901 is due to an alteration in classification, the deaths being allocated to the other headings, chiefly to "Phthisis." This largely accounts for the apparent increase in "Phthisis" in recent years.

TABLE VII.

Showing mean Weekly Temperature of Earth at Depth of 1ft. and 4ft. for the Year 1904.

Week ending.	1 foot.	4 foot.	Number of Deaths per week. from Diarrhœa
May 7	49·0	48·0	1
,, 14	50·0	48·0	3
,, 21	53·8	49·3	1
,, 28	54·5	50·5	1
June 4	55·0	51·8	2
,, 11	57·5	53·0	0
,, 18	59·5	54·0	1
,, 25	60·2	55·0	0
July 2	60·7	55·9	1
,, 9	61·7	56·8	1
,, 16	65·4	58·8	2
,, 23	65·8	60·2	5
,, 30	66·0	60·5	8
Aug. 6	67·0	61·1	21
,, 13	64·0	61·3	30
,, 20	60·6	60·4	43
,, 27	57·6	58·5	31
Sept. 3	61·0	58·3	30
,, 10	59·5	58·4	24
,, 17	57·1	57·7	24
,, 24	55·9	56·6	13
Oct. 1	54·4	55·7	8
,, 8	51·9	54·8	7
,, 15	50·0	53·5	3
,, 22	51·5	52·0	6

TABLE VIII.

Weekly Deaths from Diarrhœa from 1892-1904.

Week of the Year.	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904
25th...	5	18	0	4	7	0	1	1	3	1	2	0	0
26th ..	3	34	1	11	11	0	2	5	2	1	3	1	1
27th...	4	37	4	19	20	1	1	1	4	1	2	0	1
28th...	5	41	5	28	14	10	4	3	4	2	1	0	2
29th...	16	42	8	28	35	7	4	4	12	4	1	3	5
30th...	12	42	15	38	51	13	14	11	21	15	2	1	8
31st ...	13	33	20	37	49	21	18	24	16	17	0	9	21
32nd...	9	20	22	26	16	41	32	25	25	17	0	9	30
33rd...	13	14	28	18	14	53	28	31	27	24	2	9	43
34th...	11	12	16	25	15	60	35	46	38	22	2	12	31
35th...	15	17	14	22	8	48	48	36	38	27	3	15	30
36th...	26	13	8	18	6	37	31	42	24	29	4	8	24
37th...	21	8	8	23	1	28	32	17	12	16	6	10	24
38th...	12	13	4	24	1	15	24	7	18	6	10	8	13
39th...	8	10	3	6	2	7	10	3	11	8	19	6	8
40th...	4	9	3	8	1	2	13	2	7	10	16	6	7
41st ...	5	8	1	10	1	3	4	3	4	5	19	2	3
42nd...	2	0	0	5	2	0	3	3	2	2	10	1	6
43rd...	0	5	0	3	0	1	3	1	3	2	8	2	4
44th...	1	1	2	1	0	0	6	0	1	1	5	0	2

TABLE IX.

LEICESTER BOROUGH.

Showing estimated Population, Marriage-rates, Birth-rates, and Death-rates (General and Zymotic) per 1000 living during the last 59 years, 1845—1904.

Year.	Estimated Population.	Marriage Rate.	Birth Rate.	Death Rate.	Zymotic (Death) Rate.
1845	54,737	24·04	40·14	30·85	9.07
1846	55,707	21·00	39·72	29·48	8·11
1847	56,696	18·80	35·36	25·69	4·12
1848	57,705	20·86	34·71	25·77	5·87
1849	58,736	21·58	36·96	28.73	7·05
1850	59,788	24·04	37·45	23·64	4·13
1851	60,760	21·11	40·11	25·57	5·48
1852	61,467	22·96	38·83	28·84	8·42
1853	62,181	22·90	36·71	27·02	5·45
1854	62,903	20·40	39·06	25·11	6·65
1855	63,624	19·14	36·16	23·55	2·87
1856	64,366	20·02	37.32	21·16	3·10
1857	65,119	20·60	37·48	27·58	8·19
1858	65,835	19·14	34·54	28·76	8·07
1859	66,663	22·56	37·77	24·59	4·99
1860	67,456	19·80	38·05	20·47	1·27
1861	68,638	18·58	37·01	25·25	5·71
1862	70,986	21·30	38·37	23·38	3·01
1863	73,413	25·74	40·00	29·95	7·96
1864	75,922	25·68	41·01	26·96	5·41
1865	78,516	25·38	41·09	25·02	5·20
1866	81,197	24·94	42·02	23·33	3·37
1867	83,970	22·18	41·66	24·59	4·31
1868	86,837	22·62	41·32	28·15	7·88
1869	89,804	21.12	41·87	25·60	5·10
1870	92,873	21·22	40·90	27·33	7·24
1871	95,823	23·06	41·55	26·07	5.83
1872	98,251	23·90	42·36	26·95	8·23
1873	100,741	24·00	44·14	23·83	5·05
1874	103,294	20·90	42·34	24·29	3·83
1875	105,913	22·36	40·31	27·28	6·56
1876	108,599	22·64	44·02	23·58	5·26
1877	111,355	21·24	42·68	23·48	3·21
1878	114,182	19·38	41·85	21·89	4·18
1879	117,083	19·48	40·11	22·64	3·06
1880	120,059	19·60	40 04	24·73	6·48
1881	123,146	18·66	38.26	21·55	4·45
1882	126,275	19·02	38·46	20·04	3·23

TABLE IX.—Continued.

Year.	Estimated Population.	Marriage Rate.	Birth Rate.	Death Rate.	Zymotic (Death) Rate.
1883	129,483	18·64	37·26	19·18	2·56
1884	132,773	17·34	36·53	22·12	4·20
1885	136,147	16·36	34·39	19·39	3·32
1886	139,606	17·46	34·80	19·62	2·81
1887	143,153	16·60	32·79	19·10	3·05
1888	146,790	15·48	32·79	18·16	2·45
1889	150,520	16·08	31·82	16·63	2·30
1890	154,344	16·52	30·44	17·79	2·18
1891 *	177,353†	19·16	33·58	21·22	3·39
1892‡	180,550	16·71	32·21	18·00	2·57
1893‡	183,900	15·85	32·65	19·72	3·56
1894	187,250	16·70	32·01	14·57	1·93
1895	190,600	16·41	31·28	17·41	3·01
1896	194,100	17·52	32·00	16·88	2·98
1897	197,600	16·78	31·63	17·98	1·97
1898	201,250	17·78	30·56	17·29	3·41
1899	204,900	17·58	30·61	18·18	3·41
1900	208,600	17·30	29·75	17·87	3·60
1901	212,498	17·17	29·03	15·71	2·34
1902	216,389	16·19	29·17	14·65	1·54
1903	220,272	16·20	27·31	13·91	1·53
1904	224,186	15·92	26·67	14·56	1·95

N.B.—The above figures, prior to the year 1891 are those supplied by Mr. J. T. Biggs to the Royal Commission on Vaccination, and are taken from the Commission's 4th Report. They are the revised populations and rates.

* All figures after 1891 refer to extended Borough.

† This is the Population of the extended Borough. The figures in the other columns for same year refer to the old Borough.

‡ The figures for the nine years, 1892–1900, have been revised on the basis of the 1901 Census.

TABLE X.

Number of cases of Infectious Diseases notified in 33 Towns in England and Wales during 52 Weeks ending 31st December, 1904.

(From the Registrar General's Annual Summary.)

33 GREAT TOWNS.	Estimated Population in the middle of 1904.	Smallpox.	Scarlet Fever.	Diphtheria, including Membranous Croup.	Enteric Fever.	Continued Fever.	Cholera.	Erysipelas.	Puerperal Fever.
London	4,648,950	489	13,439	7219	1896	29	1	4943	273
Croydon	144,419	4	288	309	21	...	...	68	9
West Ham ...	288,424	15	949	531	199	1	...	216	11
Brighton	126,286	1	168	59	32	...	...	95	6
Portsmouth ...	198,038	...	727	608	224	12	...	88	10
Norwich	115,538	...	115	72	110	1	...	79	8
Plymouth ...	114,003	...	683	68	76	...	...	139	7
Bristol	343,204	34	1272	1051	148	...	...	249	27
Wolverhampton ...	98,194	12	486	80	8	...	...	68	6
Birmingham ...	537,965	8	1666	640	254	1	...	602	36
Leicester ...	**224,186**	**297***	**554**	**97**	**60**	...	...	**229**	**14**
Nottingham ...	248,811	291	1170	543	293	...	...	17	1
Derby	120,449	209	650	147	57	1	...	139	16
Birkenhead ...	114,814	42	624	112	101	6	...	52	15
Liverpool... ...	723,430	19	3001	1062	454	23	...	955	53
Bolton	175,744	883	476	150	157	2	...	69	9
Manchester ...	557,938	135	2182	554	365	1	...	275	37
Salford	228,983	56	1046	421	203	7	...	169	21
Oldham	139,497	248	630	156	76	...	...	75	19
Burnley	100,569	31	241	78	66	1	...	133	9
Blackburn ...	132,134	2	457	60	111	...	..	81	7
Preston	115,055	99	105	79	125	3	...	46	11
Huddersfield ...	94,925	39	483	60	63	...	...	26	8
Halifax	107,580	77	481	76	45	...	...	73	7
Bradford	285,809	100	1237	846	191	1	..	204	19
Leeds	450,142	63	1294	363	264	3	...	325	26
Sheffield	432,940	43	2902	416	345	3	..	389	30
Hull	253,865	78	505	536	201	15	...	326	13
Sunderland ...	151,157	35	198	75	130	10	...	120	3
Gateshead ...	118,067	395	409	54	37	...	...	63	3
Newcastle-on-Tyne	225,362	355	914	247	32	3	...	217	5
Cardiff	176,313	11	659	406	43	2	...	111	13
Swansea	95,931	1	508	216	51	1	...	26	3

* The true number of cases of Smallpox occurring in Leicester during 1904 was 307; see Special Smallpox Report.

TABLE XI.

Number of Deaths from certain specified causes in 1904 and ten previous years.

	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.
Smallpox	...	...	...	...	...	0	0	0	5	21	4
Measles	106	29	120	12	211	31	49	17	73	74	32
Scarlet Fever	30	15	48	73	44	42	28	6	11	15	4
Diphtheria	12	36	53	73	63	222	316	155	29	28	6
Whooping Cough	12	87	47	82	19	84	46	77	67	36	89
Typhoid Fever	27	38	40	38	27	28	26	20	12	13	14
Diarrhœa	176	369	272	360	323	292	286	224	137	133	289
Enteritis	17	50	68	112	86	109	90	78	42	52	35
Cancer	98	110	102	153	116	139	140	161	171	192	213
Phthisis	207	189	220	215	221	202	230	271	272	266	353
Apoplexy and Paralysis	127	158	151	179	164	187	164	182	207	179	201
Convulsions	144	142	147	185	170	151	134	159	120	117	107
Heart Disease	209	247	245	266	271	294	305	290	343	322	301
Bronchitis and Pneumonia ...	439	495	452	535	553	565	623	494	480	421	405
Premature Birth	137	156	109	151	131	143	135	130	151	154	111
Atrophy and Debility	177	185	226	202	166	209	187	204	191	168	187
Old Age	163	197	193	160	189	224	211	198	214	218	240
Violence	72	89	104	96	67	115	109	110	110	88	87
Ill-defined and not specified causes	31	35	46	36	19	23	38	42	53	45	49

TABLE XII.

Showing the number of Notifications Certificates for the principal Zymotic Diseases in the Ten years, 1894-1903, and in the year 1904.

DISEASE.	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	Annual Average for 10 years, 1894–1903.
Small Pox	9	4	0	0	0	0	0	4	9	406	321	43·2
Scarlet Fever ...	855	723	2110	1645	923	1247	839	758	826	533	554	1045·9
Diphtheria	66	75	170	229	218	892	1452	1034	320	211	97	446·7
Enteric Fever ...	215	248	283	215	237	162	117	126	81	58	64	174·2
Erysipelas	171	202	264	218	230	341	306	181	225	214	239	236·1
Typhus	...	...	..	...	..	...	...	...	..	...	.	...
Cholera	...	1	...	...	...	...	...	...	...	...	...	...
Puerperal Fever ...	6	10	18	20	11	18	26	12	15	11	16	14·7
TOTALS	1322	1265	2845	2327	1619	2660	2740	2115	1476	1433	1291	1960·8

TABLE XIII.

Showing the Number of Deaths from Zymotic Diseases in the ten years 1894-1903, and in the year 1904.

Disease.	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904
Small Pox	0	0	0	0	0	0	0	0	5	21	4
Measles	106	29	120	12	211	31	49	17	73	74	32
Scarlet Fever	30	15	48	73	44	42	28	6	11	15	4
Diphtheria	12	36	53	73	63	222	316	155	29	28	6
Whooping Cough	12	87	47	82	19	84	46	77	67	36	89
Fevers { Typhus	0	0	0	0	0	0	0	0	0	0	0
Enteric	27	38	40	38	27	28	26	20	12	13	14
Simple continued	0	0	0	0	0	0	0	0	0	0	0
Diarrhœa	176	369	272	360	323	292	286	224	137	133	289
Erysipelas	7	6	10	6	9	13	5	5	6	9	6
Influenza	13	8	9	0	14	6	41	13	14	6	17
Cholera	0	0	0	0	0	0	0	0	0	0	0
Puerperal Fever	2	3	4	7	2	6	8	4	5	3	5
Totals	385	591	603	651	712	724	805	520	359	338	446

TABLE XIV.

Showing the Population, Inhabited Houses, Marriages, Births and Deaths for the year 1904, and 15 years preceding.

Year.	Estimated Population.	No. of Inhabited Houses.	Marriages.	Registered Births.	Corrected Number of Deaths.			Deaths in Public Institutions.
					Total all Ages.	Under One Year.	Under Five Years.	
1889	150,520	29,407	1211	4789	2513	1004	1276	270
1890	154,344	30,175	1276	4699	2799	958	1263	271
1891	177,353	35,795	1366	4790	3026	1039	1533	230
1892	180,550	37,095	1509	5816	3250	1150	1658	393
1893	183,900	37,895	1458	6006	3627	1324	1768	450
1894	187,250	38,818	1564	5995	2730	971	1301	383
1895	190,600	39,438	1564	5962	3320	1232	1611	406
1896	194,100	40,349	1701	6212	3277	1154	1624	441
1897	197,600	41,519	1658	6252	3553	1288	1758	340
1898	201,250	44,472	1789	6152	3480	1183	1703	406
1899	204,400	44,585	1801	6273	3727	1230	1707	543
1900	208,600	44,884	1805	6207	3729	1083	1627	583
1901	212,498	45,547	1825	6169	3338	1098	1435	553
1902	216,389	47,712	1752	6313	3172	981	1303	473
1903	220,272	48,348	1785	6018	3065	971	1279	583
1904	224,186	49,043	1785	5981	3266	964	1255	601

NOTE.—In 1891 (Census year) the Borough was extended.
Population of old Borough was 142,581; of new Borough, 177,353.
No. of Inhabited Houses of old Borough was 29,288; of new Borough, 35,795.

TABLE XV.

Showing the Annual Death-rates of Children, and proportion of Deaths in Public Institutions in a Thousand Deaths, for the year 1904, and 16 years preceding.

In Year.	Birth Rate per 1000 of the Population.	Death Rate per 1000 of the Population.	Deaths of Children under one year of age per 1000 of the Registered Births.	Deaths of Children under one year of age per 1000 of Total Deaths.	Deaths of Children under five years of age per 1000 of Total Deaths.	Deaths in Public Institutions per 1000 of Total Deaths.
1888	32·61	17·98	204·7	371·2	505·7	121·2
1889	31·82	16·68	209·6	399·5	507·7	107·4
1890	30·44	17·79	203·7	342·2	451·2	96·7
1891	33·58	21·21	214·5	346·3	511·1	95·3
1892	32·21	18·00	197·7	353·8	510·1	120·9
1893	32·65	19·72	220·4	365·0	487·4	124·0
1894	32·01	14·57	161·9	355·6	476·5	140·2
1895	31·28	17·41	206·6	371·0	485·2	119·2
1896	32·00	16·88	185·7	352·1	495·5	134·5
1897	31·63	17·98	206·0	362·5	494·7	95·7
1898	30·56	17·29	191·1	311·2	489·3	116·6
1899	30·61	18·18	196·0	330·0	458·0	145·7
1900	29·75	17·87	174·1	290·4	436·3	156·3
1901	29·03	15·71	178·0	328·9	429·0	165·6
1902	29·17	14·65	163·5	327·0	434·3	145·3
1903	27·31	13·91	161·8	323·6	426·3	194·3
1904	26·67	14·56	162·8	298·2	384·2	184·0

TABLE XVI.

Rates of Mortality of Children under one year of age from the chief Infantile Diseases, per 1000 Births.

Disease.	1899.		1900.		1901.		1902.		1903.		1904.	
	Total Deaths.	Rate per 1000 Births.	Total Deaths.	Rate per 1000 Births.	Total Deaths.	Rate per 1000 Births.	Total Deaths.	Rate per 1000 Births.	Total Deaths.	Rate per 1000 Births.	Total Deaths.	Rate per 1000 Births.
From all causes	1230	196·0	1083	174·6	1098	177·9	981	139·5	971	161·3	974	162·8
Atrophy and Debility ...	209	33·3	175	28·2	194	31·4	179	28·3	168	27·9	180	30·0
Diarrhœa	246	39·2	256	41·2	192	31·1	121	19·1	116	19·2	248	41·4
Convulsions	130	20·7	107	17·2	130	21·0	108	17·1	103	17·1	87	14·5
Lung Diseases	177	28·2	233	37·5	322	52·1	411	65·1	288	47·8	190	31·7
Premature Births... ...	143	22·7	135	21·7	130	21·0	151	23·9	154	25·5	111	18·5
Tubercular Diseases ...	54	8·6	53	8·5	53	8·5	85	13·4	71	11·7	49	8·1
Measles	9	1·1	9	1·4	6	·9	29	4·5	12	1·9	11	1·8
Whooping Cough... ...	46	7·3	25	4·0	33	5·3	39	6·1	22	3·6	50	8·3

TABLE XVII.

Total Deaths, Death-rate, and Percentage of Deaths, from the eight principal groups of Diseases.

DISEASE.	1901.			1902.			1903.			1904.		
	Total Deaths.	Rate per 1000 Living.	Relative Percentage of Total Deaths.	Total Deaths.	Rate per 1000 Living.	Relative Percentage of Total Deaths.	Total Deaths.	Rate per 1000 Living.	Relative Percentage of Total Deaths.	Total Deaths.	Rate per 1000 Living.	Relative Percentage of Total Deaths.
Zymotic	529	2·4	15·8	375	1·7	11·7	359	1·6	11·9	481	2·1	14·7
Parasitic	3	·001	·08	0	·00	·0	1	·0	·0	2	·0	·0
Dietetic	10	·04	·2	7	·03	·1	6	·02	·2	10	·04	·3
Constitutional ..	559	2·6	16·7	584	2·7	17·4	621	2·8	20·7	725	3·2	22·1
Local	1528	7·1	45·7	1462	6·7	46·0	1369	6·2	45·6	1348	6·0	41·2
Developmental ...	558	2·6	16·7	581	2·6	17·3	576	2·2	19·2	564	2·5	17·2
Violence	110	·5	3·2	110	·5	3·4	88	·4	2·9	87	·3	2·6
Ill-defined ...	42	·1	1·2	53	·2	1·6	45	·2	1·5	49	·2	1·5

TABLE XVIII.

Deaths in each Ward from the chief Zymotic Diseases in 1904.

Name and Number of Ward.	Small Pox.	Whooping Cough.	Measles.	Scarlet Fever.	Diphtheria.	Fever.	Diarrhœa.	Totals.
1. Saint Martin's ...	...	...	...	...	...	...	6	6
2. Newton	...	9	4	...	...	...	29	42
3. Saint Margaret's ...	...	5	6	...	...	3	33	47
4. Wyggeston	3	11	6	1	1	...	18	40
5. Latimer	1	9	2	1	...	...	20	33
6. Charnwood	...	...	...	...	...	...	13	13
7. Wycliffe	...	13	2	...	1	3	19	38
8. De Montfort	...	1	...	...	...	...	10	11
9. Castle	...	5	...	1	1	...	26	33
10. Westcotes	...	7	1	...	1	1	12	22
11. The Abbey	...	7	1	...	...	...	14	22
12. Belgrave	...	7	...	...	...	...	20	27
13. West Humberstone ...	...	5	2	...	...	...	17	24
14. Spinney Hill	...	9	1	...	2	5	15	32
15. Knighton	...	...	1	1	...	...	18	20
16. Aylestone	...	1	6	...	...	2	19	28

Deaths at Borough Isolation Hospital have been distributed to their respective wards.

TABLE XIX.

ENTERIC FEVER.—Cases and Deaths in past years.

Year.	Population.	Cases Notified.	Deaths.	Cases per 1000 Pop.	Deaths per 1000 Pop.
1880	120,000	245	46	2·041	·383
1881	123,000	179	29	1·455	·235
1882	126,000	110	19	·873	·150
1883	129,000	85	10	·658	·117
1884	133,000	55	16	·413	·120
1885	136,000	216	36	1·588	·264
1886	140,000	141	19	1·007	·135
1887	143,000	222	31	1·552	·216
1888	147,000	266	32	1·809	·217
1889	151,000	147	22	·973	·145
1890	154,000	165	24	1·071	·155
1891	177,000	178	29	1·005	·163
1892	180,000	116	17	·644	·094
1893	184,000	392	47	2·130	·255
1894	187,000	215	27	1·149	·144
1895	191,000	248	38	1·298	·198
1896	194,000	283	40	1·458	·206
1897	198,000	215	38	1·085	·191
1898	201,000	237	27	1·179	·134
1899	205,000	162	28	·790	·136
1900	209,000	117	26	·359	·124
1901	212,000	126	20	·594	·094
1902	216,000	81	12	·374	·055
1903	220,000	58	13	·263	·059
1904	224,186	64	14	·285	·062

PART III.

SANITATION, &c.

HOUSES UNFIT FOR HABITATION.

During the year, 28 houses were certified by the Medical Officer of Health as unfit for habitation (under section 43 of the Leicester Improvement Act, 1881), and the usual notices served on the owners to render them fit for habitation. The cause of unfitness was in most cases general dilapidation, dampness, &c. In five cases the cause was insufficient light and ventilation.

As the result of the notices, twenty of the houses were repaired and put in order, and the remaining eight were voluntarily closed. It was not found necessary to make closing orders for compulsory closure in any of the cases.

I do not believe that there are many houses in Leicester that could be legally condemned as unfit for habitation other than those which are dealt with by the Sanitary Department year by year, and which in nearly all cases are due to the fact that the owners have neglected them, and allowed them to fall temporarily out of repair. At the same time there is undoubtedly, in certain quarters of the town, a very large amount of old and poor-class property, consisting of small cottages cheaply built in the first instance many years ago and before the days of modern bye-laws. This kind of property is continually getting out of repair and requiring attention, and minor defects of one kind or another are generally to be found almost every time they are visited. It is this kind of property, indeed, that is responsible for a very considerable proportion of the large number of sanitary and informal orders made by the Sanitary Department every year.

In the houses to which I am referring the buildings and their surroundings are poor and squalid, and certainly cannot be regarded as a desirable environment in which to rear children. The rental, however, of these little cottages is generally low—usually from 2s. 9d. to 3s. 6d. per week—and this, of course, is all-important in the case of those who are "below the poverty line," as most of those who inhabit them appear to be.

Moreover, most of this property is comparatively near the centre of the town, and therefore within walking distance of the place of work—a point of great importance, because it is out of the question for persons of this class to afford the penny fares at present charged on the tram cars.* If cheaper means of transit could be provided, one great inducement for the poor to crowd into the small back streets in the centre of our large towns would be largely removed. I should like to see work-people's cars run at certain hours of the day, charging only a halfpenny for any distance. This arrangement might perhaps diminish profits, and looked at from the strictly financial point of view it may not meet with much favour at first, but surely a public tram service is intended first for the greatest good of the greatest number, and only secondly as a money making investment. Certainly cheaper fares must tend to encourage the working classes to live in the more healthy outskirts of the town, instead of crowding, as at present, into the congested and comparatively unhealthy central portion. Many of these poor-class houses to which I have been referring would then be closed automatically, as it would no longer pay to keep them in repair. They would eventually be pulled down, and the sites utilised for more suitable purposes.

THE GARDEN CITY MOVEMENT.

Intimately connected with the housing question is the experiment which is now being conducted at Letchworth—viz., the building of an entirely new town on model lines. One of the consequences of this experiment, if it succeeds as it seems likely to do, will be to stimulate existing towns to conform as far as possible to the ideal set before them in Garden City. Those who are familiar with this movement will know that the land difficulty having been solved by the preliminary purchase of all the land on which the town is to be built and also in the immediate neighbourhood, the town will be laid out in such a way that the factories and workshops will occupy the centre of the town, whilst the population will be distributed on the outskirts with ample air-space to every house. In this way all congestion of population in the centre of the town, with its attendant evils from a sanitary point of view, will be avoided.

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* A penny fare four times a day means 2s. a week.

THE WATER-CARRIAGE SYSTEM AND "PAIL" CONVERSION.

The great work begun seven years ago of converting all "pail" closets in the Borough to water closets has now been practically completed, only a few isolated or exceptional cases remaining to be dealt with. No less than 5397 pail closets have now been replaced by water closets or abolished. The immense superiority, from a sanitary point of view, of a good water-carriage system over conservancy systems is now generally recognised, and Leicester is certainly to be congratulated upon the courage with which the problem of conversion was faced, and upon the manner in which it has been carried out. That so little real difficulty or opposition has been experienced is due to the policy pursued by the Committee and also very largely, I have no hesitation in saying, to the tact, perseverance and unfailing courtesy with which the necessary negotiations with property owners have been carried out by Chief Inspector Braley. This work of pail conversion has added very greatly to his duties and responsibilities, but he has the satisfaction of knowing that the manner in which he has carried the work through is fully appreciated.

FACTORIES AND WORKSHOPS ACT.

The total number of workshops entered on our register is 971, in addition to 244 bakehouses. The number of visits paid by the Inspectors to workshops was 941 and to bakehouses 411. The number of notices served to abate nuisances or defects discovered was 75. The work of measuring up workshops has now been practically completed, cards signed by the Medical Officer of Health, and stating how many persons may be employed in each room, being hung up in each workshop.

BAKEHOUSES.

There are 244 bakehouses in the Borough. After January 1st, 1904, it became illegal to use any existing underground bakehouse, unless certified by the Local Authority that it was suitable for the purpose. Fortunately, the number of underground bakehouses in Leicester was comparatively small, there being only seven. They were all visited and inspected, with the result that two, recently erected, were certified without any alterations being required; in two others alterations and improvements in regard to lighting and ventilation were required to be made, and they were then certified: and three others were closed.

In future no new underground bakehouse can be permitted.

A bakehouse is deemed to be an underground bakehouse "if any room used for baking, or for any process incidental thereto, is so situate that the surface of the floor is more than 3 feet below the surface of the footway of the adjoining street, or of the ground adjoining or nearest to the room."

WATER SUPPLY.

The water supply of Leicester is upland surface water collected in three impounding reservoirs on the Charnwood Forest. The total area of the gathering ground is 10,760 acres. The reservoir at Thornton is the oldest, and was constructed under the Act of 1847. The Bradgate reservoir was built next, under the Act of 1866: whilst that at Swithland was built under the Act of 1890. The total capacity of the three reservoirs is 1,379,000,000 gallons, supplying a population of 265,254 persons.

The quality of the water is very good, both for drinking and domestic purposes. Being largely derived from rain water it is naturally very soft.

It is carefully filtered through sand before it leaves the waterworks.

The Leicester water supply undertaking was taken over by the Corporation in 1878, since when the Swithland reservoir has been added, as stated above.

Owing to the phenomenally rapid growth of the town in recent years, and to the prospect of continued growth, it was evident that the existing supply would shortly prove insufficient, and this prospect has been intensified by the diminishing rainfall.

Repeated efforts to obtain an adequate further supply of good water in the neighbourhood of Leicester having failed, the great Derwent Valley Scheme was entered upon five years ago, by which Leicester, in conjunction with Sheffield, Derby and Nottingham, is to obtain a magnificent supply of excellent water from the watershed of the river Derwent in North Derbyshire. The scheme provides for the construction of three great impounding reservoirs in the wild and picturesque valley of the Derwent, and two others in the valley of the Ashop, and Leicester, after much litigation, succeeded in obtaining the right to the lion's share of the enormous volume of water which these will collect.

Although the works in connection with these reservoirs and with laying the mains is advancing steadily, it will still be several years before the Derwent Valley water reaches Leicester. When it does reach the town the water problem will be solved for very many years to come. In the meantime fears have been entertained that a serious shortage might occur. To meet this, arrangements have been entered into with the Loughborough Corporation for a temporary supply of water from the Blackbrook reservoir, after the needs of Loughborough have been satisfied.

REFUSE DISPOSAL.

During 1904 the amount of refuse destroyed at the different Corporation Destructors, was as follows:—

	TONS.
Nedham Street	12,033
Mill Lane	12,588
The Lero	12,313
West Humberstone	8,769
Total	45,703

ALCOHOL AND PUBLIC HEALTH.

Of all the influences at work in our midst adversely affecting the public health there can be no question that one of the greatest is that of drink.

Also there is no question that this is a preventable evil: indeed, we may go so far as to say that no evil is more preventable.

I cannot, therefore, agree with those Medical Officers of Health who profess to regard this subject as outside the sphere of practical State Medicine. It is true that the question is also a social one, but now-a-days it is recognised that social questions and public health questions are intimately involved. The Housing question is an instance in point: and the two questions may fairly be compared. Both are social questions of the first importance: both affect the morale of the people, and both have an influence upon health. But of the two, the Alcohol question has a much more direct and palpable bearing on health. Since, therefore, we admit the Housing question to the domain of State Medicine, much more must we also admit the question of Alcohol.

Nor can we refuse to regard it as a practical question. If every Medical Officer of Health and every Sanitarian directed his energies uncompromisingly against the evil of drink, pointing out in unequivocal terms the dangers and pitfalls attending the use of alcoholic beverages, it is scarcely possible but that the effect would be great, first in modifying public opinion, and afterwards in modifying the habits of the public.

INFANTS' MILK DEPOTS.

This is a subject which is at present engaging the serious attention of the Sanitary Committee. A Special Report on this subject by the Medical Officer of Health is appended.

A Sub-Committee has been appointed to collect information and to visit other towns where depôts have already been started.

It is scarcely necessary to observe that an infants' milk depôt is only intended to provide for infants whose mothers are unable to suckle them.

If the poorer classes can be induced to use the specially prepared milk provided at a depôt, I have little doubt that great benefit will accrue.

The chief difficulty seems to be to bring the depôt milk within reach of the very poor, who simply cannot afford to feed their babies on milk. Nevertheless, as no other food but milk can suffice for the needs of an infant, efforts will have to be made, through the Guardians, or some other philanthropic institution, to provide the milk free of charge to those who are unable to pay for it.

CHIEF INSPECTOR'S REPORT

UPON THE

WORK OF THE SANITARY DEPARTMENT

DURING 1904.

To the Medical Officer of Health.

Sir.—I beg to submit the following Report of work done by the Inspectors in the Sanitary Department during the year 1904. The appended Tables show the number and nature of nuisances abated.

I am, Sir,
Your obedient servant,
FRANCIS BRALEY, *Cert. San. Inst.*,
1st May, 1905. Chief Inspector.

REPORT FOR 1904.

The number of house-to-house inspections is below the average, the time of the Inspectors having been occupied in visiting the numerous contacts in connection with the 321 cases of smallpox reported during the year.

The division, furnishing, and sub-letting of small houses has greatly increased of late, and the supervision of these houses occupies a great portion of the time of the Inspector on whose district they are chiefly situated.

It is to be regretted that in recent years the cultivation of plots of land at the rear of many cottages has ceased.

377 articles have been purchased under the sale of Food and Drugs Acts, and submitted for analysis—viz., milk 206, bread 18, flour 6, butter 83, margarine 1, coffee 22, mustard 3, pepper 2, ale 4, gin 4, rum 5, whiskey 6, brandy 3, sweet spirits of nitre 3, cream of tartar 6, vinegar 4.

7 of these samples were certified to be adulterated, the vendor of one sample of milk was fined 10/- and costs, another 40/-, a third case was dismissed on account of an informality in the summons, and another was cautioned by letter from the Town Clerk. The vendors of three samples of butter were also cautioned by letter.

Proceedings were instituted against a butcher for exposing for sale on a stall in the Market Place 28 pieces of veal, intended for human food, and which were diseased and unfit for the food of man; the defendant was fined £10 or a month's imprisonment; proceedings were also taken against a man for hawking fish in the street, the same being putrid and quite unfit for human food. He was sent to prison for two months with hard labour, having been fined 10/- for a similar offence in the previous year.

98 boats plying on the canal were visited by the Inspector, 7 infringements of the regulations were reported, notices were served in each case and the defects remedied. The boats were occupied by 148 men, 68 women, 28 children over 5 years of age, and 19 children under 5 years. There are 121 boats on the register.

STATEMENT A.

Showing the work done by the Sanitary Staff during the Year 1904.

	No. of Visits.
House to House Inspections	16,227
Special Inspections and Investigations of Complaints	33,670
Re-inspections to ascertain the progress of Sanitary and Informal Orders	15,118
Visits in connection with Contagious Diseases	4,290
Visits to Common Lodging Houses	3,599
Visits to Bakehouses	411
Visits to Canal Boats	100
Visits to Workshops	941
Visits to Retail Shops	109
Visits to Refreshment Room Kitchens	34
Visits to Fish Shops	178
Visits to Caravans	683
Visits to Ice Cream Shops	111
	75,471
Samples of Food, &c., purchased for Analysis under Adulteration Acts	377
Samples of Well Water submitted for Analysis	3
Observations for the purpose of Smoke Prevention	860
Stacks reported for Smoke Nuisance	35
Houses Disinfected by the Sanitary Staff	1,196
Swine reported to Medical Officer of Health	116
Filthy Houses ditto ditto	108
Dilapidated Houses ditto ditto	18
Prosecutions under the Public Health and Local Acts	2
Ditto ditto Food and Drugs Acts	2
Houses to which Smoke Test was applied	621
Public Buildings, Factories, &c. ditto	8
Houses to which Liquid Test was applied	154
Public Buildings, Factories, &c. ditto	4
Visits to Dairies and Milkshops	532
Letters (including Complaints of Nuisances) received	2,756
Letters (including School and Sanitary Notices) sent out from the Offices	5,544

STATEMENT B.

During the year Formal and Informal Notices have been served to abate Nuisances as follows:—

	No. of Orders.
To abolish Manure-pits and Ash-pits	192
,, repair ditto ditto	2
,, provide Ash-tubs or Bins	1,502
,, abolish Privies	4
,, ,, Pail Closets	5
,, erect new Water Closets	17
,, repair, alter, or rebuild Closets	2
,, fix Closet Hoppers and Syphons	71
,, fix Flushing Apparatus and lay on Water Supply	48
,, repair ditto and ditto	41
,, alter and ventilate Soil Pipes	3
,, stop up or disconnect Cellar Drains	3
,, lay New Drains	1
,, relay or repair Defective Drains	276
,, clear Choked Drains	378
,, cleanse or repair Cisterns	34
,, fix lead or iron Sink Wastes	39
,, fix Traps or Gully Gratings	66
,, reset Gullies or provide new Gratings	40
,, erect, alter, screen, or repair Urinals	3
,, repair, re-hang, or provide new doors for Closets and Dwellings	25
,, repair, renew, and make good Spouting	126
,, cleanse and limewash Closets and Passages	26
,, pave Yards and Passages, or repair Paving	170

STATEMENT B.—Continued.

	No. of Orders.
To provide new or relay and repair Floors	101
„ repair Roofs	130
„ cleanse and limewash Houses	377
„ ventilate Dwellings	2
„ remove Manure and Offensive Matter	26
„ remove Animals kept in such a condition as to be a Nuisance	18
„ alter Chimneys and Miscellaneous	116
„ reduce Number of Persons occupying Houses ...	31
„ repair Staircases	15
„ fix 4-inch Ventilating Pipes	18
„ repair Walls	109
„ insert Damp Proof Courses	8
„ alter or repair Rain Water Pipes	30
	*4,055

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* The 4,055 Defects ordered to be remedied were contained in 3,298 Notices, and of these 464 were Formal and 2,834 Informal Orders.

STATEMENT C.

Showing the number of Offensive Trades carried on, and Registered and Licensed Premises within the Borough requiring the constant attention of the Inspectors.

Description of Trade.	No.
Slaughter Houses (Registered)	78
,, ,, (Public)	18
Tripe Houses	36
Common Lodging Houses	33
Bakehouses	244
Cowsheds	50
Milk Shops and Dairies	659
Tallow Melters	1
Chemical Works	2
Tanners and Fellmongers	1
Bone Boilers	2
Knacker's Yard	1
Gut Scrapers	2

STATEMENT D.

Showing the number of Visits made by the Inspectors of Meat, and the quantity of Meat, &c., condemned during the year **1904**.

No. of visits to Slaughter Houses, Shops, and Cow-sheds, etc.	15,148
No. of visits to Cattle Market	499

Meat, etc., Condemned and Destroyed.

	Tons.	Cwts.	Qrs.	Lbs.
Meat	25	5	1	13
Fish	28	2	2	13
Fruit	1	4	0	11

Vegetables—Cauliflowers	98	
Rabbits	1,372	Head
Preserved Foods	453	Tins
Partridges	148	Head
Poultry	138	„
Black Grouse	27	„
Crabs	250	
Eggs	7,440	
Quails	84	

STATEMENT E.

Showing the Localities of Sewer Gas Escapes.

	No.
Into Breakfast Rooms, Sitting Rooms, and Dining Rooms	6
,, Houses from Rat Holes	10
,, Kitchens and Sculleries	13
,, Basement Kitchens and Cellars	17
,, Lobbies and other parts of Houses	10
,, Internal Water Closets	6
,, External Water Closets	74
,, Yards, from around badly set Gullies, Defective Drains, &c.	96
From External and Unventilated Soil Pipes	17
,, Head and joints of downright Rain Water Pipes	35
,, Untrapped Rain Water Cisterns	5
,, Gullies in Stables	2
,, Ventilating Pipes	9
	300
And in connection with Houses in which Infectious Disease has arisen	212
TOTAL	512

STATEMENT F.

In connection with Infectious Diseases Inspection, the following defects were found, either in the houses referred to in the certificates, or in the houses, closets, &c., in the same yard.

	No.
Defective and Foul Ashpits	17
,, and dilapidated Closets	2
,, and choked Drains	29
,, and unventilated Soil Pipes	1
,, Urinal, Bath and Lavatory Wastes	1
,, Paving and Surface Channels	13
,, Untrapped or badly set Gullies to Sink and Yard Drains	18
,, Cellar Drains (direct to Sewers)	1
,, Water Closet Hoppers and Flushing Apparatus	15
,, Spouting	6
Foul Brick and defective Shafts to Sinks	3
Foul and defective Rain Water Cisterns	10
Filthy Urinals, Closets and Passages	3
Filthy Houses	18
Escapes of Sewer Gas into:	
External Closets	83
Living Rooms and Sculleries	7
Yards, from defective Drains, badly set Gullies, or Rain Water Pipes connected direct with the Sewers or Drains	122
	349

STATEMENT G.

In connection with the Inspection of Factories and Workshops, the following Sanitary defects have been found, and Formal and Informal Notices served.

	No. of Orders.
To abolish Manure and Ash-pits	1
„ provide Ash-tubs or Bins	3
„ erect New Water Closets	4
„ fix Closet Basins and Syphons	2
„ repair Flushing Apparatus and lay on Water Supply	4
„ alter and ventilate Soil Pipes	1
„ re-lay or repair defective Drains	3
„ clear choked Drains	4
„ fix Traps or Gully Gratings	2
„ erect, alter, screen, or repair Urinals	1
„ provide new, or relay or repair Floor	2
„ repair Roofs	2
„ cleanse and limewash Workshops	39
„ repair Walls	1
„ fix 4-inch Ventilating Pipes	4
„ provide Light and Ventilation	2
Total	75

HOSPITAL REPORT FOR 1904.

By ALLAN WARNER, M.D., D.P.H.,

Assistant Medical Officer of Health.

Isolation Hospital, Gilroes, Leicester,

February, 1905.

The total number of patients admitted to the Borough Hospitals during 1904 was 716, as compared with 652 in the previous year. In order to accommodate Smallpox patients, the Groby Road Hospital was closed in April to cases of Scarlet Fever, Diphtheria, etc., and remained closed until June. Fortunately, this procedure was carried out with comparatively little inconvenience, owing to a somewhat remarkable absence of infectious disease, other than Smallpox, at that time.

SMALLPOX.

The total number of cases of this disease treated in hospital during the year was 293, of which 4 proved fatal. As this disease is the subject of a special report it is not necessary here to refer to it further.

SCARLET FEVER.

The number of cases of Scarlet Fever admitted during 1904 was 239, as compared with 130 in the previous year. Two deaths occurred among the 239 patients, giving a fatality of ·8 per cent., as compared with 3·8 per cent. in 1903. This low fatality, the lowest hitherto recorded, emphasizes the marked change in virulence of this disease during recent years, especially when it is recollected that 30 years ago a fatality of 20 per cent. was by no means uncommon.

Indeed, so long as Scarlet Fever remains of the present mild type, a fatal issue is extremely unlikely, except among the weaklings and the young. The two patients who died from this disease during 1904 were both only 2 years of age.

The complications occurring during the year were the ordinary ones met with in the course of Scarlet Fever, including a large number of rhinorrhœa and otorrhœa. A few patients suffered from rheumatism and acute nephritis, and two of the latter had severe uraemic fits, but both of these recovered. There have been comparatively few cases of secondary angina, and an entire absence of post-scarlatinal diphtheria.

With regard to cross-infection, I have to record eleven cases of chicken-pox. One patient, suffering from Scarlet Fever, was admitted whilst incubating this disease. As soon as it developed the child was at once separated from the other patients in the pavilion, but not before another patient had contracted the disease. Curiously, this patient was a man of 22, the only adult out of 26 patients, and he in turn infected others.

In a former hospital report I have referred to the poorly nourished and uncleanly condition of many of the patients admitted to the Hospital. The weight of a badly nourished child as compared with the average weight of a child of the same age and height, readily affords some index of the amount of wasting. For example, a very neglected boy, aged 12 years, was admitted to the Hospital during last year who weighed only 35 lbs., whilst an average boy of the same age and weight would weigh 76 lbs

On the other hand, cleanliness is difficult to standardize, for dirt is not easily measured. But anyone who has much acquaintance with children will recognise that a child, though quite recently bathed, will quickly become superficially dirty. Such a condition we may call accidental dirtiness, but beyond this there is a dirtiness due to neglect, *e.g.*, when patients are covered with vermin.

With a view to determining how many of the patients would come under the category of "dirty," as the result of neglect, I examined every patient admitted throughout last year, suffering from Scarlet Fever, Diphtheria, or Typhoid Fever, as to the presence or absence of the head louse *(pediculus capitis)*, or its eggs (nits).

The results may be summarized as follows:—

	Number Examined.	With Clean Heads.	With Dirty Heads	Per Centage with Dirty Heads
Females over 14 years	45	15	30	66·6
Females under 14 years	146	20	126	86·3
Males over 14 years ...	39	28	11	28·2
Male under 14 years...	151	35	116	76·8
* Total... ...	381	98	273	71·6

Of the 273 patients whose heads were dirty, 152 were found to have actual lice upon them, the remaining 121 having "nits" only, sometimes in large numbers, at others only decernible on close examination. Among the 20 girls whose heads were found to be clean, at least six were not attending the Council Schools, so that 90 per cent. of the girls going to the Elementery Schools were dirty. When the parent's attention is drawn to this condition of their children's heads, they invariably say that it must have been "caught at school." In many cases, no doubt, this is merely an excuse for their own neglect, but it is quite certain that if such children are allowed to attend school they must quickly infect many others. This dirty condition is not only a mark of bad habits at home, not only a source of contagion to others, but it is conceivable that it may be also responsible for the spread of other infectious diseases. The head-louse acting as a "carrier" just as fleas upon rats have been proved to carry plague to human beings. It seems to me, therefore, that the Education Authority would do well to keep several observant women to systematically examine the head of every child coming to school, and if necessary, they might obtain powers to compel parents to keep their children's heads clean.

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* To make the numbers more complete the patients admitted during January, 1905, have been included.

Dr. Kerr, the Medical Officer to the Education Department in London, stated recently that "they had at last got the necessary machinery to work so that parents must either clean the children's heads or go to the Police Court and be fined a sovereign."

DIPHTHERIA.

There were 26 cases of Diphtheria admitted to the Hospital during the past year, and only one of these died. This is equivalent to a fatality of 3·8 per cent., as compared with a fatality of 12·7 per cent. in 1903. In seven of the cases the larynx was affected, and five of these required operative treatment. Intubation was performed in four cases, all of which recovered, and tracheotomy in one, the latter case proving fatal. In October, 1901, the administration of larger doses of antitoxin was commenced, and the operation of intubation for laryngeal obstruction was introduced in place of tracheotomy. Moreover, the practice of prescribing alcohol for this disease was discontinued. Since the above date, 400 cases of Diphtheria have been treated in the Hospital, and 28 of them have died, giving a fatality of only 6·7 per cent.

TYPHOID FEVER.

During 1904 there were 37 cases of Typhoid Fever admitted to the Hospital, 6 of which died, giving a fatality of 16·2 per cent., as compared with 24 admitted in 1903, with a fatality of 12·5 per cent. The following complications occurred in the 6 cases ending fatally:—Perforation, 4; pneumonia, 2. In addition to the above 37 cases, 4 patients were admitted to the typhoid ward, owing to erroneous diagnosis. These cases included one of Acute Rheumatism, one of Simple Enteritis, and two of Tubercular Meningitis; the last two cases proved fatal.

PHTHISIS.

The experiment of admitting Phthisical patients to the Hospital, which was commenced in the latter part of the year 1903, has been continued, 121 patients being admitted in 1904. As a rule patients whose disease was so advanced as to be likely to prove fatal within a month have been excluded, exception being made, owing to special circumstances, in one case. This patient succumbed whilst in the Hospital, death being due to a tuberculous condition of the kidneys. Of the remaining 120 patients the majority were under treatment for one month only, but in 19 comparatively incipient cases their stay was extended to two months. Fresh air, good diet, rest, and other hygienic conditions obtainable at the Hospital, have almost invariably had a wonderful effect on these patients, increasing their appetite for food and its assimilation, allaying cough, and producing natural sleep. In other words, raising the resistance of the body to the tubercle bacilli, and assisting in the repair of the damaged tissues. However, it must be obvious to all that such a form of treatment has its limitations from a curative point of view. The benefit derived differing in each individual according to the extent of the disease, and the natural resistance.

Since September, 1903, up to the time of writing, there have been 200 Phthisical patients admitted to the Hospital. Of this number 111 had lost by Phthisis either a grandparent, parent, brother or sister. The view held to-day as to the hereditary nature of this disease is that the tubercle bacillus is only transmitted from parent to offspring with extreme rarity. But what is inherited is a special predisposition to the disease, in other words, a Phthisical constitution.

There is much evidence to show that the tubercle bacillus, or seed, is of very widespread distribution, it therefore seems almost hopeless to destroy all sources of infection since they are so widely distributed. Consequently, although the proper destruction of all tuberculous spectum is greatly to be desired, it appears to me of far greater importance in combating the spread of consumption to get rid of the causes of special predisposition to the disease, which may be either inherited or acquired.

The peculiarities transmitted from parent to offspring have been brought about by the mode of living adopted by the parents or their ancestors. These inherited physical tendencies can doubtless be much modified by environment or manner of life. In fact, the whole question of the prevention of consumption is largely bound up with the great social problem of poverty.

The principal object, therefore, of a month's stay in the Hospital is not curative, but educational, hygienic, preventive.

It is difficult at present to gauge completely the value of this new undertaking, but we have reason to believe that not only are the patients themselves benefited by the treatment, but many are educating their acquaintances to more hygienic modes of life.

ALCOHOL.

During the year no alcoholic stimulants were prescribed for any patient suffering from either smallpox, scarlet fever, or diphtheria, and in all these diseases the hospital fatality was very low, as will appear from the figures given above. In typhoid fever alcohol was prescribed for some eight patients.

HOSPITAL STAFF.

I am pleased to be able to report that the Staff have been remarkably free from illness during the past year, and there have been no cases of infectious disease amongst them.

HONORARY CHAPLAIN.

Our thanks are due to Canon Gedge, who has continued to act as honorary chaplain to the hospital throughout the year, and whose visits every Tuesday are much appreciated.

GIFTS TO THE HOSPITAL.

Gifts of toys, books, magazines, etc., have been kindly sent to the hospital by the following friends:—

Ashwell, Mrs.
Bowmar, Mr.
Brooks, Mr.
Davey, Miss
Emms, Miss
Ellis, Mrs. Bernard
Faire, Mrs. S.
Gedge, Rev. Canon
How, Mrs.
Herrick, Mr.
Herrington's, Limited
Jones, Mr.
Lakin, Ald. & Mrs.
Lennard, Miss & Master
Muston, Miss
Morris, Mrs.
Roberts, Mr.
Winterton, Mrs.
Windley, Ald.
Vaughan, Rev. Canon
Free Library
Messrs. Bennett
Midland Educational Co.
Y.M.C.A.
Mrs. Plant's School
Medway Street Council School
Wyggeston High School (Girls)

BACTERIOLOGICAL REPORT.

The specimens examined during the past year were as follows:—Thirty-five specimens of blood were examined for Widal's typhoid reaction. Twenty-five of these were positive. This reaction is not only obtainable with the blood of persons actually suffering from the disease, but also with those who have recently suffered from it. Owing to this on more than one occasion it has been possible to trace the source of infection to persons who had suffered from unrecognised attacks.

The sputum from 69 patients was examined for tubercle bacilli, and in 53 instances with a positive result.

Throat swabs from 17 persons were examined for diphtheria bacilli, and in eleven instances the bacilli were found to be present.

The usual tables are appended herewith.

ALLAN WARNER, M.D., D.P.H.,

Assistant Medical Officer of Health.

TABLE I.

Showing the number of Patients admitted to the Borough Hospitals during 1904.

	Scarlet Fever.	Diphtheria.	Typhoid.	Smallpox.	Consumption.	Total.
Remaining in Hospital, Dec. 31st, 1903	26	6	9	13	19	73
*Admitted, Jan. 1st, to Dec. 31st, 1904	239	26	37	293	121	716
Discharged during 1904	189	30	39	302	127	687
Died during 1904	2	1	6	4	1	14
Remaining in Hospital, Dec., 1904 ...	74	1	1	0	12	88
The average number of days spent in the Hospital by Patients admitted Jan. 1st to Dec. 31st, 1904 ...	43	30·5	45	29·6	...	...

* Seven other cases were admitted owing to erroneous diagnosis. Two of these died from Tuberculous Meningitis.

TABLE II.

ISOLATION HOSPITAL EXPENDITURE.

From APRIL 1st to MARCH 31st.

	1903—1904.			1904—1905.		
	£	s.	d.	£	s.	d.
Resident Medical Officer's Salary ...	147	10	0	150	0	0
Matron's Salary	61	8	1	64	3	4
Wages	1,612	2	4	1,587	17	5
Provisions	1,846	5	7	1,843	7	7
Ale, Wine and Spirits	21	12	8	26	1	1
Domestic Utensils	32	18	1	37	15	7
Furniture, Fittings and Bedding ...	493	8	7	218	16	10
Drugs, Instruments, &c.	226	14	10	161	19	2
Coal, Gas and Water...	885	3	3	740	6	2
Rates and Insurance...	266	12	10	217	4	1
Horse Hire	85	19	3	68	11	6
Telephone	13	0	0	13	0	0
Advertising, Printing, &c.	33	7	10	33	14	7
Labour, &c., at Grounds	221	2	3	248	9	1
Brushes, Soap and Miscellaneous ...	72	12	2	188	13	10
Alterations and Repairs	179	15	6	235	12	1
	6,199	13	3	5,835	12	4
Additional Buildings—Labour and Materials	646	10	9	835	5	3
Repairs to Drains	...		...	158	14	2
	£6,846	4	0	£6,829	11	9

PUBLIC ANALYST'S REPORT.

FOR THE YEAR 1904.

Town Hall, Leicester.
April, 1905.

To the Chairman and Members of the Sanitary Committee.

Gentlemen.—My report for the year 1904 is as follows:—

The total number of samples purchased by your Inspectors under the Food and Drugs Acts, and submitted for analysis, was 378. This is rather more than in the previous year, but is rather less than the ratio of two samples for every 1000 inhabitants. My numerous other duties, however, including the large amount of extra work involved by the epidemic of Smallpox prevented me from devoting as much time to this work as I could have wished.

The number of samples purchased of the different articles is shown in Table A.

Three samples of new milk, one sample of skimmed milk, and three samples of butter were found to be technically adulterated, and were certified accordingly. The particulars of each adulterated sample are shown in Table B. The small amount of serious adulteration is very satisfactory.

In the case of a sample, No. 115 (not shown in the Table), the Inspector asked for butter, and was served with something that looked like butter wrapped in a plain paper. Before the purchase was completed, however, the vendor announced that it was margarine and not butter. The vendor was cautioned by the Sanitary Committee.

As regards the fraudulent sale of margarine for butter, not one instance of this was detected during the year. This is very satisfactory. In my last report I mentioned that a man, against whom a summons had been issued for this offence, had absconded before the summons could be served. From information received there is good reason to think that this man was an arch-offender, and that he had been the means of getting other tradesmen into trouble. His procedure appears to have been as follows: He would go round to small shopkeepers with a basket containing some eggs and a few half-pound packets of what he described as "best dairy butter," and which, if the statement of his victims are correct, they honestly believed to be genuine butter. In reality, as proved on analysis, it was margarine, though closely resembling genuine butter both in appearance and taste. Several of these small shopkeepers were fined last year for selling this stuff as butter. Now, however, that the man referred to has left the town it is to be hoped that they will not in future be thus victimised or exposed to temptation.

In the case of a sample of adulterated milk (No. 120) the vendor, who was carrying on his father's business, the father having retired, gave his father's christian name, which was the name entered on the summons, though the latter was served on the son, who was the real vendor. When the case was heard, the magistrates held that the summons had not been served. As, however, the time-limit had expired, it was not possible to issue a fresh summons. The case had accordingly to be dropped. This case illustrates one of the many difficulties sometimes experienced in bringing offenders to justice.

Tables A. and B. are appended.

Your obedient Servant,

C. KILLICK MILLARD, M.D., D.Sc.,

Public Analyst for the Borough under the
Food and Drugs Acts.

TABLE A.

Showing Number of Samples Analysed during 1904.

Nature of Article.	Number of Samples taken.	Number found to be Adulterated.
Milk (new)	194	3
,, (skimmed)... ...	6	1
,, (condensed) ...	6	0
Butter	84	3
Margarine	1	Improperly labelled
Bread	18	0
Flour	6	0
Coffee	22	0
Mustard	3	0
Pepper	3	0
Vinegar	4	0
Spirits	18	0
Ale	4	0
Cream of Tartar ...	6	0
Sweet Spirits of Nitre ...	3	0
Total	378	7

TABLE B. PARTICULARS OF ADULTERATED SAMPLES.

No. of Sample.	Nature of Article purchased.	Nature and Amount of Adulteration.	Action taken by Sanitary Committee.
108	Butter	Contained 90 of foreign fat	Vendor cautioned. Had only taken the business the same day that sample was purchased. The sample was one of Margarine, sold inadvertently as butter.
120	Milk	Contained 7·0 of added water and was deficient of 13 of its fat.	Vendor prosecuted, but his name was incorrectly stated on the summons, and it was therefore held that the summons had not been served. The time limit having expired, the proceedings had to be dropped.
245	Butter	Contained 23 of water ...	The sample was one of "milk-blended" butter, but was not labelled as such, and no mention was made of the fact till after the purchase was completed. The Vendor was cautioned.
312	Milk (Skimmed) ...	Contained 19 of added water.	Vendor prosecuted, and fined 10s. and 16s. costs.
351	Milk	Contained 13 of added water.	Vendor prosecuted and fined 40s.
354	Butter	Contained 24 of water ...	A similar case to No. 245. Vendor cautioned.
373	Milk	Deficient of 8 of its fat ...	Vendor cautioned.

MORTALITY TABLE.

Deaths in the Borough of Leicester during the 52 Weeks ending December 31st, 1904

	0 to 1		1 to 5		Under 5		5 to 20		20 to 40		40 to 60		60 to 80		80 and upwards.		Over 5		All Ages.		Total.
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
CLASS 1.																					
SPECIFIC FEBRILE OR ZYMOTIC DISEASES.																					
1.—Miasmatic Diseases.																					
Small-pox: Vaccinated																					
Small-pox: Unvaccinated																					
Small-pox: Not known																					
Small-pox: Not stated	1				1			2			1						1	2	2	2	4
Measles	10	1	7	12	17	13	2										2		19	13	32
Scarlet Fever			2		2		1			1							1	1	3	1	4
Diphtheria			1	4	1	4		1										1	1	5	6
Whooping Cough	25	25	11	25	36	50	1	2									1	2	37	52	89
Typhus Fever																					
Enteric or Typhoid Fever							1	3	4	3	1	2					6	8	6	8	14
Simple Continued Fever																					
Other Miasmatic Diseases							1		3	1	3	2	3	3	1		11	6	11	6	17
2.—Diarrhœal Diseases.																					
Dysentery													1				1		1		1
Diarrhœa	136	112	18	18	154	130							1	4			1	4	155	134	289
Cholera																					
3.—Malarial Diseases.																					
Ague																					
Remittent Fever																					
4.—Zoogenous Diseases.																					
Cowpox, and Effects of Vaccination																					
Hydrophobia																					
Glanders																					
Splenic Fever																					

5.—Venereal Diseases.																					
Syphilis	1	4	1	......	2	4	......	......	......	......	......	......	......	......	......	......	......	......	2	4	6
Gonorrhœa, Stricture of Urethra ...	......	......	......	......	......	......	......	......	1	......	2	......	3	......	......	......	6	......	6	......	6
6.—Septic Diseases																					
Erysipelas	......	1	......	......	......	1	1	......	......	1	......	......	1	2	......	......	2	3	2	4	6
Pyæmia, Septicæmia	1	......	......	......	1	......	......	......	......	......	......	1	......	......	......	......	......	1	......	1	1
Puerperal Fever	......	......	......	......	......	......	......	......	......	5	......	......	......	......	......	......	......	5	......	5	5
CLASS II.	174	143	40	59	214	202	7	8	8	11	7	5	9	9	1	......	32	33	246	235	481
PARASITIC DISEASES.																					
Thrush and other Vegetable Parasitic Diseases	2	......	......	......	2	......	......	......	......	......	......	......	......	......	......	......	......	......	2	......	2
Worms, Hydatids and other Animal Parasitic Diseases	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
CLASS III.	2				2														2		2
DIETIC DISEASES.																					
Want of Breast Milk, Starvation	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Purpura and Scurvy	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Alcoholism { *a.* Delirium Tremens	......	......	......	......	......	......	......	......	......	......	......	1	......	......	......	......	......	1	......	1	1
Alcoholism { *b.* Intemperance	......	......	......	......	......	......	......	......	1	......	......	7	1	......	......	......	2	7	2	7	9
CLASS IV.									1			8	1				2	8	2	8	10
CONSTITUTIONAL DISEASES.																					
Rheumatic Fever	......	......	......	......	......	......	......	......	......	......	......	1	......	......	......	......	......	1	......	1	1
Rheumatism	......	......	......	2	......	2	2	1	......	1	1	2	3	......	......	......	6	4	6	6	12
Gout	......	......	......	......	......	......	......	......	......	......	......	......	1	......	......	......	1	......	1	......	1
Cancer, Malignant Disease	......	......	......	......	......	......	1	4	7	9	35	43	49	58	2	5	94	119	94	119	213
Cancrum Oris (Noma)	......	......	......	......	......	......	......	......	......	1	......	......	......	......	......	......	......	1	......	1	1
Rickets	8	6	2	3	10	9	......	......	......	......	......	......	......	......	......	......	......	......	10	9	19

DEATHS—continued.

	0 to 1		1 to 5		Under 5		5 to 20		20 to 40		40 to 60		60 to 80		80 and upwards.		Over 5		All Ages		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
Tabes Mesenterica	3	1	4	...	7	1	...	...	...	...	...	...	...	...	...	...	...	...	7	1	8
Phthisis	4	4	6	4	10	8	25	16	94	74	78	39	6	3	...	...	203	132	213	140	353
Hydrocephalus and Tubercular Meningitis	20	11	11	17	31	28	7	7	1	...	2	2	...	...	...	...	10	9	41	37	78
Other forms of Tuberculosis	3	3	1	2	4	5	1	...	...	...	...	...	...	...	...	...	1	...	5	5	10
Scrofula	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Anæmia, Chlorosis, Leucocythæmia	...	...	...	...	...	...	1	1	...	1	1	2	...	...	...	...	2	4	2	4	6
Diabetes	...	...	...	...	...	...	1	1	2	...	6	5	5	3	...	...	14	9	14	9	23
Other Constitutional Diseases	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	38	25	24	28	62	53	38	30	104	86	123	94	64	64	2	5	331	279	393	332	725
Class V.																					
LOCAL DISEASES.																					
1.—Diseases of Nervous System.																					
Inflammation of Brain or Membranes	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Apoplexy, Softening of Brain, Paralysis	1	...	...	...	1	...	5	1	4	7	23	32	57	56	6	9	95	105	96	105	201
Insanity, General Paralysis of Insane	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	1	1	1	1	2
Chorea	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	1	1
Epilepsy	...	...	...	...	...	...	2	2	2	...	1	1	...	3	...	...	5	6	5	6	11
Convulsions	47	40	13	7	60	47	...	...	...	...	...	...	...	...	...	...	...	...	60	47	107
Laryngismus Stridulus	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1
Disease of Spinal Cord, Paraplegia, Paralysis Agitans	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	2	...	2	...	2
Other Diseases of Nervous System	...	...	1	...	1	...	...	...	...	...	1	2	...	...	...	...	1	2	2	2	4
2.—Diseases of Organs of Circulation.																					
Pericarditis and Endocarditis	...	...	...	...	...	...	3	2	...	2	1	...	...	1	...	...	4	5	4	5	9
Heart Disease	7	4	2	2	9	6	8	5	19	20	39	40	57	84	7	7	130	156	139	162	301
Aneurism	...	...	...	...	...	...	...	...	1	...	4	...	1	1	...	...	6	1	6	1	7
Embolism, Thrombosis	...	...	...	...	...	...	...	...	...	2	1	2	2	4	...	2	3	10	3	10	13
Other Diseases of Blood Vessels	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	1

3.—Diseases of Respiratory Organs.																					
Laryngitis	...	...	...	3	...	3	1	...	...	2	...	1	...	...	...	...	1	3	1	6	7
Bronchitis	29	22	14	16	43	38	1	3	3	...	13	14	39	50	9	9	65	76	108	114	222
Pleurisy	1	...	...	...	1	...	...	...	...	...	2	1	2	2	...	...	4	3	5	3	8
Pneumonia	17	21	20	27	37	48	4	6	7	13	23	12	12	18	1	2	47	51	84	99	183
Asthma and Emphysema	...	...	...	...	...	...	...	...	...	...	4	2	6	1	...	...	10	3	10	3	13
Croup	...	1	1	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1	2
Other Diseases of Respiratory Organs	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	...	1
4.—Diseases of Digestive Organs.																					
Gastritis	7	8	...	1	7	9	...	...	...	...	...	...	2	...	...	...	2	...	9	9	18
Other Diseases of Stomach	1	1	...	...	1	1	...	...	...	...	1	...	1	...	...	...	2	...	3	1	4
Enteritis	19	10	2	3	21	13	...	...	...	...	...	...	...	1	...	...	...	1	21	14	35
Peritonitis	7	6	4	2	11	8	1	7	2	4	2	1	...	1	...	...	5	13	16	21	37
Ascites	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Obstructive Diseases of Intestines	3	...	...	...	3	...	3	1	4	...	2	2	4	3	...	...	13	6	16	6	22
Fistula	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pancreas Disease, &c.	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	2	...	2	2
Cirrhosis of Liver	...	...	...	...	...	...	...	...	1	2	2	1	10	3	...	...	13	6	13	6	19
Jaundice, and other Diseases of Liver	2	...	...	...	2	...	...	1	...	...	2	1	1	2	1	2	4	6	6	6	12
5.—Diseases of Urinary Organs.																					
Nephritis	...	...	1	...	1	...	2	...	3	1	4	12	3	7	...	...	12	20	13	20	33
Bright's Disease (Albuminuria)	...	...	...	...	...	...	...	...	2	...	4	4	5	3	...	...	11	7	11	7	18
Diseases of Bladder or Prostrate	...	...	...	...	...	...	...	...	...	...	1	1	4	1	...	...	5	2	5	2	7
Calculus (Stone)	...	...	1	1	1	1	...	...	...	...	...	1	1	...	...	...	1	1	2	2	4
Other Diseases of Urinary System	...	...	...	...	...	...	...	...	2	...	...	3	2	3	1	...	5	6	5	6	11
6.—Diseases of Reproductive System.																					
(a) ORGANS OF GENERATION.																					
Male Organs	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Female Organs	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	1

DEATHS—continued.

	0 to 1		1 to 5		Under 5		5 to 20		20 to 40		40 to 60		60 to 80		80 and upwards.		Over 5		All Ages.		Total.
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
(*b*) Of Parturition.																					
Abortion, Miscarriage										1								1		1	1
Puerperal Convulsions																					
Placenta Prævia, Flooding																					
Other Accidents of Childbirth										6								6		6	6
7.—Diseases of Integumentary System.																					
Phlegmon																					
Ulcer, Carbuncle									1	1	2	1	2	3			5	5	5	5	10
Other Diseases of Skin, &c.		1				1														1	1
8.—Diseases of Bones and Joints.																					
Caries and Necrosis							2										2		2		2
Arthritis, Ostitis, Periostitis	1				1							1		3				4	1	4	5
Other Diseases of Bones and Joints																					
9.—Diseases of Organs of Special Sense.																					
Ear, Eye, Nose									1			2					1	2	1	2	3
10.—Diseases of Lymphatic System, &c.																					
Lymphatics and Spleen							1										1		1		1
Bronchele, Addison's Disease																					
Quinsy																					
	142	114	60	62	202	176	34	29	53	61	133	141	212	251	25	31	457	513	659	689	1348

CLASS VI.																				
DEVELOPMENTAL DISEASES.																				
Premature Birth ...	64	47			64	47													64	47	111
Atelectasis	3	1			3	1													3	1	4
Congenital Malformations																					
Teething ...	9	7	3	3	12	10													12	10	22
Atrophy, Inanition, Debility	98	77	1	4	99	81					1		3	3			4	3	103	84	187
Old Age ...													60	68	53	59	113	127	113	127	240
	174	132	4	7	178	139					1		63	71	53	59	117	130	295	269	564
CLASS VII.																					
DEATHS FROM VIOLENCE.																					
1.—Accident or Negligence.																					
Fracture and Contusions			2		2		3	2	4	1	9		6	1	1	1	23	5	25	5	30
Gunshot Wounds																					
Cut, Stab ..																					
Burns and Scalds	1	2	1	1	2	3						2						2	2	5	7
Poison ...							1		1	2	2		1				5	2	5	2	7
Drowning ...			3		3				3		1		6				10		13		13
Suffocation	2	9			2	9								1				1	2	10	12
Otherwise ...												1						1		1	1
2.—Homicide.																					
Manslaughter																					
Murder ...	1				1														1		1
Suicide.									8		4	1		3			12	4	12	4	16
	4	11	6	1	10	12	4	2	16	3	16	4	13	5	1	1	50	15	60	27	87

DEATHS—continued.

	0 to 1		1 to 5		Under 5		5 to 20		20 to 40		40 to 60		60 to 80		80 and upwards.		Over 5		All Ages.		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F		F	
Class VIII. **DEATHS FROM ILL-DEFINED AND NOT SPECIFIED CAUSES.** (*e.g.*, Dropsy, Abscess, Tumour, Hæmorrhage, Mortification, Death from Natural Causes, &c.)	2	3	......	......	2	3	5	2	5	4	5	9	6	8	......	......	21	23	23	26	49
	2	3	......	......	2	3	5	2	5	4	5	9	6	8	......	......	21	23	23	26	49
Class I.—Zymotic Diseases	174	143	40	59	214	202	7	8	8	11	7	5	9	9	1	......	32	33	246	235	481
,, **II.—Parasitic Diseases**	2	......	......	......	2	......	......	......	......	......	......	......	......	......	......	......	......	......	2	......	2
,, **III.—Dietic Diseases**...	......	......	......	......	......	......	......	......	1	......	......	8	1	......	......	......	2	8	2	8	10
,, **IV.—Constitutional Diseases** ...	38	25	24	28	62	53	38	30	104	86	123	94	64	64	2	5	331	279	393	332	725
,, **V.—Local Diseases**	142	114	60	62	202	176	34	29	53	61	133	141	212	251	25	31	457	513	659	689	1348
,, **VI.—Developmental Diseases** ...	174	132	4	7	178	139	......	......	......	......	1	......	63	71	53	59	117	130	295	269	564
,, **VII.—Violent Deaths**	4	11	6	1	10	12	4	2	16	3	16	4	13	5	1	1	50	15	60	27	87
,, **VIII.—Ill-Defined, &c.**...	2	3	......	......	2	3	5	2	5	4	5	9	6	8	......	......	21	23	23	26	49
Total	536	428	134	157	670	585	88	71	187	165	285	261	368	408	82	96	1010	1001	1680	1580	3260

Borough of Leicester.

REPORT

UPON

EPIDEMIC DIARRHŒA

IN

1904.

BY

C. KILLICK MILLARD, M.D., D.Sc.

Medical Officer of Health.

LEICESTER:

Geo. Palmer, Printer, Albion Street, Leicester.

Town Hall, Leicester,

November 16th, 1904.

To the Chairman and Members of the Sanitary Committee.

Gentlemen,

EPIDEMIC DIARRHŒA IN 1904.

I beg to report to you upon the epidemic of Diarrhœa which has prevailed in the Borough during the past summer.

Before dealing with this year's experience, however, it will be well to refer briefly to the experience of the past.

As is well known, Leicester has for many years suffered severely from this disease: much more so, indeed, than the majority of large towns. Although there are several towns with a higher Diarrhœa-rate than Leicester, *e.g.*, Preston, Salford, Burnley, Hull and Sheffield, these are almost all towns in which the general death-rate is also high. It may safely be said that no large town in which the average general death-rate for the past ten years is as low as that of Leicester suffers nearly so much from Diarrhœa.

The cause of this high Diarrhœa-rate in Leicester has been made the subject of repeated investigations. Successive Medical Officers of Health have reported on the subject to your Committee, and several of these reports are of high scientific value. Indeed, it is not too much to say that very much of what has now become general knowledge as to the natural history of this disease was discovered and first published in Leicester. In this connection the names of Drs. Johnston and Tomkins deserve honourable mention, and reference must also be made to an exhaustive report prepared for your Committee in the year 1875 by Drs. Buck and Franklin

To pass in review all the work that has been done on the subject of Diarrhœa in Leicester would be beyond the scope of this report. Suffice it to say that it is now generally believed that the disease is produced by a *specific micro-organism* or *germ*, just as is the case with Scarlet Fever or Diphtheria: that the condition most favourable and, indeed, essential for the activity of this germ is a *high temperature acting upon a polluted subsoil*: but that other factors—*e.g.*, street dust, contaminated food, parental neglect, &c.—also play an important part.

The disease is prevalent only during the hot months of summer, epidemics beginning usually in July or August, particularly the latter month, and lasting on an average from six to eight weeks. The severity and duration of an epidemic depends upon the weather, the disease being very much more fatal in hot summers.

It has been found, however, that the temperature of the *air* has only an indirect relationship, the essential point being the temperature of the *subsoil*. For many years now it has been our practice to take daily readings during the summer months of the temperature of the subsoil as recorded by thermometers placed one foot and four feet below the surface of the ground. It is found that the summer rise in Diarrhœal mortality does not begin until the four-foot earth thermometer has reached at least 56° F., no matter what the temperature of the atmosphere may have been. It is also found that the number of deaths from Diarrhœa is usually highest in the week in which the four-foot earth thermometer attains its mean weekly maximum, and that the decline in the number of deaths coincides more or less with the decline of the four-foot earth temperature, which temperature declines much more slowly than the temperature of the atmosphere.

The disease, although it may attack persons at any age, is chiefly confined to very young children, in which class almost all the fatal cases occur. It is, indeed, essentially a disease of infants.

The following table shows the number of deaths attributed to Diarrhœa in Leicester each year for the past twenty years, together with the average annual mortality per 10,000 population for each successive quinquennium.

TABLE I.

Year.	No. of Deaths.	Average Annual No. of Deaths.	Average Annual Mortality per 10,000 Population.	Year.	No. of Deaths.	Average Annual No. of Deaths.	Average Annual Mortality per 10,000 Population.
1884	344	236	16·8	1894	176	300	15·5
1885	186			1895	369		
1886	256			1896	272		
1887	247			1897	360		
1888	148			1898	323		
1889	121	231	13·0	1899	292	212	10·0
1890	218			1900	286		
1891	204			1901	224		
1892	214			1902	137		
1893	399			1903	133		
				1904	275	—	—

From this it is seen that during the five years ending 1888, the average annual mortality from Diarrhœa per 10,000 population was 16·8; during the next five years it was 13·0; during the next, 15·5; and during the five years ending 1903 it was only 10·0. This certainly indicates improvement during recent years, but in comparing one year with another, the all-important influence of temperature must always be borne in mind. Thus, there is no doubt that the low figures for the last two years, 1902 and 1903, must be chiefly attributed to the exceptionally cold and wet summers experienced in these years. We shall see presently, however, that the improvement has not been distributed equally over the Borough, some districts having improved much more than others, although the meteorological conditions must have affected all alike.

LOCAL DISTRIBUTION OF THE DISEASE.

A point of great interest in connection with the disease is its local distribution in the Borough. As is well known, certain districts of the town suffer very much more severely than others; some parts of the town, indeed, being almost exempt. As the experience of a single year is not altogether reliable, I have worked out the average Diarrhœa mortality for each ward of the Borough for the ten years, 1894 to 1903. The result is set out in the following table.

TABLE II.

Name of Ward.	Average Annual Mortality per 10,000 Population. 10 years, 1894-1903.
Newton	25·7
Wyggeston	25·2
St. Margaret's	23·0
West Humberstone	17·8
Latimer	14·5
St. Martin's	10·5
The Castle	10·4
Belgrave	10·1
The Abbey	9·4
Aylestone	9·1
Charnwood	8·7
Wycliffe	7·6
Spinney Hill	7·0
Westcotes	5·9
De Montfort	5·1
Knighton	5·0

The terrible contrast between the different wards is very striking, and we are led to ask the reason for this contrast. It will be noticed that the Diarrhœa mortality is much higher in the three wards, Newton, St. Margaret's and Wyggeston, than in any of the others. This is only what we should have expected, for these wards contain much of that portion of the town which has long been recognised as the "Diarrhœa Area." This area may, for convenience, be considered as being roughly bounded as follows:—On the west, by the River; on the north, by the Canal and the Willow Brook; on the east, by the Willow Brook; and on the south, by a line running from the point where the Willow Brook turns under Cottesmore Road to the L. and N.W. Goods Station, and then along Humberstone Road, Humberstone Gate and High Street. Diarrhœa mortality is not, of course, confined to this area, but a study of the "spot" maps for past years shows that it is very much worse in this area than in the rest of the town. Speaking generally, the area thus mapped out has the following characteristics.

1. The area is very low lying, much of it formerly being liable to be flooded.

2. Until the recent tributary sewerage scheme was begun, the sewers throughout almost the whole of the area were very defective and had insufficient fall, with the result that sewage readily escaped into the subsoil.

3. The paving of the streets was, and still is in many places, very defective and uneven, and not laid on concrete.

4. As the result of the above conditions it is not surprising that the subsoil for several feet below the surface is highly polluted, in many places being black in colour and saturated with organic matter.

5. Lastly, but not least important, it is the oldest part of the Borough, and the greater part of it is covered with old and very poor class property.

As the result of this the inhabitants, taken as a whole, belong to a lower social stratum than in the newer and more favoured districts. Their earning power is less, they have less money to spend on food and clothing, they are less clean in their homes and persons, and they have a lower vitality.

It is in these characteristics, I believe, that the explanation largely, if not entirely, lies of the much higher Diarrhœa-rate in these three wards—Newton, St. Margaret's and Wyggeston—than in the rest of the Borough.

The two wards with the next highest rates are West Humberstone and Latimer. Both these wards include portions of the "Diarrhœa Area."

If we now turn to the other end of the scale and consider those districts of the town in which the Diarrhœa-rate is lowest, we find that the three wards with the lowest rates are Knighton, De Montfort and Westcotes; Spinney Hill and Wycliffe coming next. The contrast between the conditions, physical and social, existing in these wards, and in those we have just been considering, will at once be apparent to anyone with even a slight acquaintance with Leicester. These wards are probably the most favourably situated districts in the town. They stand comparatively high and are well drained. The houses are mostly new and built in conformity with modern bye-laws: the subsoil is comparatively clean, there being little opportunity for pollution. Moreover, the inhabitants belong to a more prosperous class.

Speaking generally, I believe it will be found that the Diarrhœa-rate varies in any given ward according as the conditions approximate on the one hand to those we have just considered, or, on the other hand, to the conditions prevailing in the so-called "Diarrhœa Area."

INFLUENCE OF SUBSOIL.

Before leaving this part of the subject, I will just refer to the influence of geological formation. It is generally stated that a porous subsoil, such as sand or gravel, is more favourable to a high Diarrhœa-rate than is an impermeable stratum such as clay. In Leicester, however, it does not appear that this factor affects the prevalence of Diarrhœa to any noticeable extent. The subsoil in the "Diarrhœa Area" varies, the portion nearest the river being gravel partly covered with alluvial deposits; adjacent to this is a bed of sand; whilst the rest is clay. In one or two places it is "made" ground.

In the wards where the Diarrhœa-rate is low the subsoil also varies.

Undoubtedly the really important factor as regards subsoil is not its geological formation, but the degree to which it is contaminated with organic matter, together with the presence of a certain amount of moisture. A very damp or a very dry condition of the subsoil are both stated to be unfavourable to Diarrhœa.

DECREASE IN MORTALITY IN THE VARIOUS WARDS.

We will next consider to what extent the different wards have shown improvement as regards Diarrhœa mortality during recent years, and for this purpose I have divided the ten years, 1894-1903, into two periods of five years each—viz., 1894-1898, and 1899-1903—and have calculated the average rates for each ward for these two periods. The results are set forth in the following table.

TABLE III.

Name of Ward.	Average Annual Mortality per 10,000 Population. 5 years, 1894-1898.	Ditto for 5 years, 1890-1903.	Decrease in Mortality during 5 years.
Newton	32·0	19·4	12·6
Wyggeston	29·5	20·7	8·8
St. Margaret's ..	24·6	21·4	3·2
Latimer	17·9	10·4	7·5
West Humberstone	14·0	8·9	5·1
St. Martin's ...	13·1	7·9	5·2
The Castle	12·5	8·3	4·2
Belgrave	12·3	8·7	3·6
Aylestone	11·2	7·1	4·1
Charnwood	10·9	7·7	3·2
Wycliffe	9·3	6·8	2·5
The Abbey	8·8	10·5	*1·7
Spinney Hill ...	8·4	5·6	2·8
Westcotes	8·3	4·1	4·2
De Montfort ...	7·5	2·5	5·0
Knighton	3·9	5·9	*2·0

* Increase.

These results are very interesting, the more so as it is obvious that the all-important meteorological influences must have affected all districts alike.

On referring to the table it will be seen that much greater improvement is manifest in some wards than in others. Thus, Newton ward has improved much more than have either St. Margaret's or Wyggeston; so much so that although Newton ward used to be by far the worst ward as regards Diarrhœa, it has, during the past five years, been only third worst.

It is not very easy to explain this alteration, but the following suggestions may, perhaps, partly account for it. Newton ward, which is the oldest part of the Borough, contains a large number of courts, and these courts, owing to the efforts of the Sanitary Department, have been greatly improved in the matter of paving. I think also that it is possible there has been an alteration in the age-distribution of the population in this ward. Owing to increased house accommodation in other parts of the Borough, married couples with young families may have left this ward with its small three or four-roomed houses, whilst their places have been taken by old couples without families. Assuming such a change to have taken place, even to only a small extent, it would mean that the proportion of children in Newton ward is smaller than it used to be, and this, of course, would readily account for a reduction in Diarrhœa. These are, however, only suggestions, and I have no figures to support them.

Other wards showing a considerable improvement are Wyggeston, in which the mortality has fallen from 29·5 to 20·7; Latimer, from 17·9 to 10·4; St. Martin's, from 13·1 to 7·9; and West Humberstone, from 14·0 to 8·9. Amongst the wards with a low Diarrhœa-rate there is obviously less room for improvement. De Montfort, however, has decreased from 7·5 to 2·5, and is now the lowest of all the wards; whilst Westcotes has decreased from 8·3 to 4·1, and comes second lowest. Knighton ward, on the other hand, shows a slight increase, but where the figures are so small as is the case in this ward, a slight variation is of little significance.

THE EPIDEMIC OF 1904.

Coming now to the experience of the past summer there were, up to October 15th, 275 deaths caused by Diarrhœa. The epidemic began in July, and the number of deaths each week is shown below, together with the temperature recorded by the four-foot earth thermometer.

TABLE IV.

Week Ending.	4ft. Earth Thermometer.	Number of Deaths from Diarrhœa.
June 25	55·0	0
July 2	55·9	1
„ 9	56·8	1
„ 16	58·8	2
„ 23	60·2	5
„ 30	60·5	8
Aug. 6	61·1	21
„ 13	61·3	30
„ 20	60·4	43
„ 27	58·5	31
Sept. 3	58·3	30
„ 10	58·4	24
„ 17	57·7	24
„ 24	56·6	13
Oct. 1	55·7	8
„ 8	54·8	7
„ 15	53·5	3

The distribution of these deaths in the different wards was, speaking generally, the same as we have seen to be the case in previous years. Newton, St. Margaret's and Wyggeston wards suffered far more severely than the rest of the Borough, the rate (per 10,000 population) being respectively 24, 23 and 21; whilst the wards with the lowest rates were Westcotes 2, De Montfort 3, Charnwood 5, Knighton 6; and Spinney Hill, West Humberstone and Wycliffe each 7.

Classifying the deaths according to ages, I find that practically the whole of the deaths (268 out of the 275) occurred under the age of two years.

Moreover, 86 per cent. of the deaths occurred under the age of one year, and of these more than half (61 per cent.) occurred under the age of six months. This confirms the well-known fact that the disease seldom proves fatal except in very young children.

Almost every house where a death from Diarrhœa has been reported has been visited either by the Sanitary Inspectress, one of the male Inspectors, or the Medical Officer of Health, and a number of particulars obtained with reference to the method of feeding, the previous health of the child, the sanitary condition and size of the house, the number of other children living, the number dead, the cause of their death, &c.

THE INFLUENCE OF THE METHOD OF FEEDING.

From these details certain data have been obtained. Thus, I find that amongst infants under six months of age who have died from Diarrhœa *only 14 per cent.* were being fed entirely from the breast, 12 per cent. were partly breast-fed and partly hand-fed, and the remaining 73 per cent. were entirely hand-fed. Even under the age of three months almost the same proportion existed—viz., only 16 per cent. were being entirely fed on the breast; another 16 per cent. were partly fed on the breast and partly on the bottle, and 68 per cent. were getting no breast milk at all. I have no figures showing what proportion of all infants born in Leicester are hand-fed, but it is quite certain that the proportion found to exist amongst infants dying of Diarrhœa is *far too high*, and the conclusion seems forced upon us that the method of feeding is a most important factor in the causation of the disease. We may safely say that an infant fed entirely from the breast runs far less risk of dying from Diarrhœa than one fed partly or entirely from the bottle. Nor is it difficult to account for this. The breast-fed infant obtains its nourishment not only in a form best suited to its digestion, but (and this is most important) absolutely free from contamination. Cow's milk, on the other hand, is not only more difficult to digest, especially if not properly prepared, but it is most readily contaminated by dust and dirt, so that the germs of Diarrhœa may readily gain access to it.

A point of great significance indicating the superiority of breast feeding is that not infrequently it was elicited that an infant was being fed on the breast until within a very few weeks of the onset of the fatal illness. This has happened too often to be merely a coincidence.

Inquiries were made to ascertain why so many babies were artificially fed instead of being suckled, and in almost all cases the reply was that the mother had not the milk. In many instances the mother had begun to feed from the breast, but after a short time the milk had failed. In a few instances it was stated that nursing disagreed with the mother, and she was advised to discontinue it for the sake of her health. The number of cases in which the cause assigned was that the mother went out to work was very small. The point was specially inquired into, but only in ten instances out of the cases investigated did the mother go out to work. In at least eleven other instances the child was illegitimate, and several of these were put out to nurse.

Another point investigated was the condition of the home and surroundings. This varied greatly. In many of the houses there was squalor, dirt and neglect, but I cannot say that this was a universal feature. In many others there was evidence of poverty; but many of the cases occurred in average working-class houses, kept in fair condition. In a few the condition of the home was distinctly good, the mother being a very careful respectable woman, and the general surroundings much above the average.

Inquiries were made as to the number of other children in the family who had died and the number remaining alive, and the following figures were obtained. The total number of families investigated was 220. In 41 of these the child whose death was being inquired into proved to be an only child: in the remaining 179 families there had been 765 other children. But of these no less than 305*, or 40 per cent., had died. This is exclusive of the deaths during the present year which were the cause of the inquiry. In nearly all cases the children had died very early in life, but it was impossible to ascertain the cause of death with any accuracy as very often the mother could not recollect what the cause was. In many cases, however, it was stated to be Diarrhœa.

This proportion of deaths to surviving children seems terribly high, and it is evident that in the families where Diarrhœa deaths occur the conditions of infant life, whatever the cause, are very unfavourable.

This leads me to another point—the previous health of the children dying from Diarrhœa. I find that in a very large proportion of the cases it is stated that the child's previous health was bad: in some, the child was apparently strong and healthy when born but never throve. This applies chiefly to the hand-fed babies. In many of the cases it would seem, therefore, that the attack of Diarrhœa was only the closing scene in an unequal struggle against adverse conditions of life. In other words there is reason to believe that Diarrhœa, to some extent at least, singles out the weaklings, and that those who survive are the more robust. If so, the effect of this high mortality in the first year of life would be to reduce somewhat the mortality at later ages.

Unfortunately, however, there is no doubt that some of the victims of Diarrhœa are not in any sense weaklings, but fine healthy babies, whose death is a serious loss to the community.

PREVENTIVE MEASURES.

As regards the preventive measures which may be taken to lessen the mortality from this disease, they can be divided into two distinct classes.

1. Measures directed towards the improvement of the general sanitation of the town.

2. Measures directed towards improving the hygiene of the home.

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* Exclusive of still-births.

1. Under the first head I will specially refer to improvements in the sewerage of the town. Considerable progress has been made in the work of relaying the old and defective tributary sewers, and rather more than half of the "Diarrhœa Area," including the whole of Wyggeston ward and a part of Newton ward, has now been completely resewered. It is much to be hoped that the remainder of the area will be proceeded with as rapidly as possible. The effect of work of this description will not, however, be manifested at once, as sewer-logged soil takes a long time to recover.

As regards the paving of the streets, all the principal thoroughfares throughout the town have recently been repaved in connection with the electric tramways, and it is to be hoped that this will be followed by improvements in the paving of the side streets, many of which are in a very unsatisfactory condition. Good paving, set in concrete and tar-grouted, is comparatively impermeable, and, moreover, it is much more easily cleansed.

This brings me to the subject of street cleansing and watering, the importance of which as a preventive measure, especially during the summer months, is probably great.

It is a question for consideration whether it would not be wise to materially increase the annual expenditure on street cleansing. At present it is only possible to sweep many of the streets at intervals of several days or a week, but when we consider the many sources of street pollution and how soon a street becomes filthy, a daily sweeping is surely not too much to expect for almost every public thoroughfare. Much more might also be done in the *washing* of the streets, as brushing alone is often insufficient. No doubt Leicester is already in advance as regards street cleansing of many large manufacturing towns, but that is no reason why she should not set a still better example. Moreover, apart from the sanitary aspect, I believe that there are few items of public expenditure that the ratepayers in general grudge less than that of street cleansing, for clean streets, both in winter and summer, contribute so greatly to the public comfort and convenience.

2. The other class of preventive measures, viz., those relating to the hygiene of the home, is very important.

It is now generally recognised that errors in the feeding of infants are responsible for many of the deaths that occur, and especially of deaths from Diarrhœa. To combat this, a Sanitary Inspectress was engaged some years ago, and one of her principal duties is to visit the houses of the poor and give instruction and advice where necessary. She has several other duties, however, and in any case the influence of one woman amongst a population of 224,000 must necessarily be very small. Recently your Committee, through the courtesy of the Registrars of Births, have begun the practice of issuing a printed card giving instructions as to the feeding and care of infants to everyone registering the birth of a child. (Previously similar instructions were issued, through the same channel, by the Women's Liberal Association.) This plan is no doubt a good one, but unfortunately the information is rather late in reaching those to whom it is intended. The average interval between the birth of a child and the registration of the birth is about six weeks, and this six weeks is often the most critical period of a child's life.

Another consideratian is that in many cases probably little notice is taken of merely printed instructions unless they are accompanied by some verbal information and advice, and the question arises whether it would not be a good thing if all homes in certain districts of the Borough in which births are registered as having occurred were visited by a suitable person, employed by the Sanitary Committee, with the object of giving such advice. By a recent decision of the Registrar General, local Registrars are now permitted to furnish Sanitary Authorities, if desired, with returns of births similar to the returns of deaths which we have long received. The fee payable to the Registrars is also similar—viz., 2d. for each return, and 2d. for each entry in the return.

In Wyggeston, St. Margaret's and Newton wards together about 1000 births occur each year, so that at the above rate it would cost between £9 and £10 a year to get returns of births from these three wards, which as we have seen are by far the worst wards of the town as regards Diarrhœal mortality.

It is obvious, however, that even if we got this information it would be quite impossible to act upon it in the way I have indicated with our present staff of one female inspector. Moreover, it is certain that in order to effect any real improvement it would be necessary in many cases to make repeated visits.

WHAT IS DONE IN MANCHESTER AND SALFORD.

In this connection I may mention what is being done in Manchester and Salford. There is in these municipalities a voluntary association known as the Manchester and Salford Ladies' Health Society which appears to be doing very useful work. This Society engages a number of superior working-class women to visit the homes of the poor and to give practical advice, and in some instances actual help, in the care and feeding of infants, the keeping of the house, elementary hygiene, &c. These "Health Visitors" are only employed for a portion of the day, so that they may have time to look after their own homes. They are under the immediate direction of a Lady Superintendent. One half of their salaries is paid by the Health Committee of the Corporation, and in return for this, and to ensure co-operation between the Society and the Health Department, the Lady Superintendent reports to the Medical Officer of Health, and as far as possible acts upon his suggestions as to the method of working, &c.

Mrs. Worthington, a member of the Society, recently gave an address on this subject before the Leicester Branch of the National Union of Women Workers. If the ladies of Leicester could see their way to starting a similar work, it is possible that very great good might result.

QUESTION OF MUNICIPAL MILK DEPÔT.

I will now refer to another and very important question, viz., the difficulty which exists in the houses of the poor in obtaining a really satisfactory substitute for the mother's milk in the case of infants *that cannot be fed from the breast.* It is not a question of wilfully adulterated milk (there is comparatively little adulterated milk now sold in the Borough), but rather of contaminated and improperly prepared milk. The proper preparation of milk in order to adapt it to the needs of an infant is a matter of some difficulty, and requires much care and skill.

To meet this difficulty, several municipalities (notably Liverpool, St. Helens, Battersea and Bradford) have established *municipal milk depôts.*

At these depôts milk is "humanised"—*i.e.*, modified so as to resemble human milk in composition, put up in sealed bottles each containing the requisite amount for a single feed for a child of any given age, and then sterilised. A sufficient number of these bottles to last an infant for one day are given out at a time, and the bottles are returned when the next day's supply is fetched. As each bottle of milk is required for use it is unsealed, a teat attached, and the infant draws the milk direct from the sterilized bottle. The results obtained in those towns which have established these depôts are apparently very encouraging. There has been a good demand for the milk, and the proportion of deaths amongst the children fed on it has been much below the average. As would be expected, the depôts cannot be made entirely self-supporting, but the charge on the rates is only small when the magnitude of the work is considered. It must be admitted that the system is still in the experimental stage, but I believe several other municipalities are thinking of following suit in the near future. Leicester also, having unfortunately a high infant mortality, might well give the system a trial. Personally, I think that a scheme of this kind offers the best prospect of any yet suggested for effectively dealing with the annually recurring "massacre of the innocents": and if it be your pleasure I will report further on the subject, giving fuller details.

Your obedient servant,

C. Killick Millard

MEDICAL OFFICER OF HEALTH.

REPORT

ON THE

SMALLPOX EPIDEMIC

IN LEICESTER

IN

1904.

BY

C. KILLICK MILLARD, M.D., D.Sc.,

Medical Officer of Health.

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Town Hall, Leicester,

February, 1905.

The Chairman and Members of the Sanitary Committee.

Gentlemen,

I beg to report to you on the epidemic of Smallpox in Leicester in 1904.

My previous report to you on the subject of Smallpox dealt with the epidemic of 1903, which comprised 394 cases with 21 deaths. The epidemic now under consideration comprises 321 cases with four deaths.

The fatality of both epidemics was low, and especially that of the last, which, I believe, is almost unique, being only 1·2 per cent.

Further experience has confirmed and strengthened the conclusions arrived at after the first epidemic.

A few salient facts may be summarised here:—

(a) Throughout the whole course of both epidemics, during which the total number of cases occurring was 715, there was NOT ONE SINGLE INSTANCE OF THE DISEASE ATTACKING A PERSON WHO HAD BEEN RECENTLY VACCINATED BEFORE EXPOSURE TO INFECTION.

(b) There was not a single member of the Hospital staff who contracted the disease, although most of the staff were constantly and severely exposed to infection.

(c) No precautions were taken to secure this happy result except recent vaccination.

(d) The loss of life caused by the two epidemics was surprisingly small.

(e) The un-vaccinated section of the community again escaped much more lightly than it was feared would be the case.

(f) Comparatively little spread of infection took place through the medium of schools.

(g) On the other hand, great spread took place THROUGH THE MEDIUM OF VERY SLIGHT CASES WHICH HAD ESCAPED DETECTION, *and such cases usually occurred in vaccinated subjects.*

Some facts relating to the history of Smallpox and Vaccination in Leicester, as also the details of the method of dealing with Smallpox pursued in Leicester, were given in my report on the 1903 epidemic.

It is a curious coincidence that in the two years, 1903 and 1904, in which the epidemics occurred, the general death-rate of Leicester was the lowest on record.

It is sometimes alleged against medical men that their special training and education prejudices them in favour of vaccination. It is possible that there is some justification for this charge. I have striven, therefore, in writing this report, to put aside all preconceived opinions, and to make it as impartial as possible.

I wish to acknowledge here the great assistance I have received in dealing with the epidemic from Chief Inspector Braley (whose work in connection with Smallpox is invaluable) and the other members of the Sanitary staff; also from Dr. Allan Warner (Assistant Medical Officer of Health) and the various members of the Hospital staff. One and all have worked loyally and well.

I am, Gentlemen,

Your obedient Servant,

C. Killick Millard

Medical Officer of Health.

SMALLPOX IN OTHER TOWNS DURING 1904.

Since this Report was written, the Registrar General's Annual Summary has appeared showing the experience of other large towns in England and Wales during the year 1904.

The following table has been prepared showing the figures for those large towns in which, during 1904, Smallpox was epidemic to the extent of one case per 1000 inhabitants.

Town.	Estimated Population.	No. of Cases.	No. of Deaths.	Attack-Rate per 1000	Mortality per 1000.	Fatality (Case-Mortality) per cent.
Derby ...	120,000	209	3	1·74	·03	1·4
Gateshead ...	118,000	395	34	3·34	·29	8·6
Leicester	**224,000**	**307**[†]	**4**[*]	**1·37**	**·02**	**1·3**
Newcastle ...	225,000	355	18	1·57	·08	5·1
Nottingham	249,000	291	12	1·17	·05	4·1
Oldham ...	139,000	248	14	1·78	·10	5·6
Stockport ...	97,000	155	14	1·60	·14	9·0

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[*] The number of deaths is stated in the Registrar General's Summary as *five*, but the correct number is *four*. See pages 17 and 18 of Report.

[†] The figure given by Registrar General is 297, but this does not include several unrecognised cases only discovered after recovery.

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cases occurred, and it was finally extinguished in August. From that time until the end of the year no further cases arose.

The present report, therefore, dealing with the epidemic of 1904, covers the period from December, 1903, to August, 1904, during which time 321 cases occurred.

PART I.

THE SMALLPOX EPIDEMIC
OF 1904.

It will be recollected that the Smallpox epidemic of 1903, which was made the subject of a special report, lasted from December, 1902, until October, 1903. For several weeks prior to the latter date only an occasional case had occurred, and then finally there was a clear interval of five weeks during which no cases were reported. During this time the few cases remaining under treatment were discharged, and on December 5th the last patient went home and the hospital was closed. The town was then believed to be quite free from the disease.

Only four days later, however, on December 9th, three cases were reported simultaneously in connection with a common lodging-house, and this proved to be the beginning of a fresh epidemic. The infection spread, and it was also re-introduced several times from outside. (See Table C in the Appendix.)

By the end of December, 14 cases had occurred. During the first three months of 1904 the outbreak only slowly increased, but in April it suddenly assumed serious proportions, over 100 cases occurring during that month. Fortunately it quickly subsided during May and June, in July only some straggling cases occurred, and it was finally extinguished in August. From that time until the end of the year no further cases arose.

The present report, therefore, dealing with the epidemic of 1904, covers the period from December, 1903, to August, 1904, during which time 321 cases occurred.

The following table shows the progress of the epidemic month by month:—

PROGRESS OF THE EPIDEMIC.

Month.	No. of Cases.
December (1903)	14
January (1904)	13
February	26
March	61
April	107
May	52
June	33
July	10
August	5
Total	321

Probably the most note-worthy feature of the epidemic was the very mild type of the disease as evidenced by its remarkably low fatality, only four cases* proving fatal, which is equivalent to a fatality on the 321 cases of only 1·24 per cent. Such a record is, I believe, almost unique. Moreover, one of the four fatal cases was an imported one—the child of a tramp—which was not infected in Leicester and did not belong to Leicester, merely happening to sicken with the disease whilst passing through the town.

Such a small loss of life is of course very satisfactory, and is all the more remarkable as occurring in Leicester where such a large proportion of the population is unvaccinated. It should be noted, however, that throughout the country during the past year the prevailing type of the disease was much more favourable than usual. In any case, it would be a grave mistake to underestimate the seriousness of Smallpox, for we have no guarantee, unfortunately, that in future outbreaks the type of the disease will be equally favourable. Moreover, apart from the risk to life, Smallpox is always a disease to be dreaded. For one thing, on account of its intensely infectious nature, there is always the risk of its getting out of control, in which case the consequences to the trade of a town would be disastrous.

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* The Registrar General records five deaths. (See footnote on page 17.)

The very mildness of the disease, though so fortunate in one respect, undoubtedly added greatly to the difficulty of stamping it out, for many cases occurred, especially in persons who had once been vaccinated, of so slight and trivial a character that the persons affected were able to go about in an infectious condition without its being known from what they were suffering. It was only after they had infected others that the real nature of their illness was discovered. Such cases were responsible for a very wide extension of the disease. Thus, to five "unrecognised" cases of this class, occurring in the short space of four weeks, no less than 40 other cases were directly traced.

Another feature of the epidemic was the number of cases occurring in common lodging-houses. Such cases have always been recognised as being specially difficult to deal with. The usual measures of vaccination and surveillance of contacts, which we have found to be so efficacious in private dwelling houses, are inadequate in the case of common lodging houses, the inmates of which are, for the most part, of nomadic habits, irresponsible, and difficult to control.

DETAILS OF THE EPIDEMIC.

On December 9th, 1903, after an interval of five weeks, as already stated, during which no cases were reported, three cases were reported simultaneously at a house in Woodboy Street, next door to a common lodging-house and occupied by the keeper of the house, J.W. The persons attacked were Mrs. W. and two children, all unvaccinated. They had all been taken ill within a day or two of each other. Inquiry elicited the fact that about a fortnight previously J.W. himself had been ill, though no eruption had appeared, but, from the history given, there is no doubt that he had suffered from an unrecognised attack of the disease and had infected his wife and children. The man had been vaccinated in infancy 37 years before, but never since. Exactly how he contracted the disease was not discovered. It was impossible to connect his case with any of the known cases which had occurred in October, but as keeper of a common lodging-house, and liable to come into contact with persons from all parts of the country, it is easy to understand how the infection could have been brought to him. Unfortunately, one of the two children who were attacked continued attending school for a day or two after being taken ill, though *before the eruption had appeared*,* and in this way she infected six other children attending the school. A third child in the house and a neighbour's child who had visited the house also contracted the disease.

THE BRITANNIA STREET OUTBREAK.

On December 22nd, whilst the Woodboy Street outbreak was still going on, a tramp, John T., staying at a lodging-house in Britannia Street, was found to be suffering from the disease. He had only just arrived in Leicester, and, from the history he gave, it is probable that he got infected in Nottingham where he had stayed for some days a fortnight previously.

Twelve days after this case was discovered, an inmate (Isaac S.) of a neighbouring lodging-house began to sicken with the disease, and though actual contact could not be proved, it is probable that he was in some way infected by John T. This case proved to be the beginning of a serious outbreak. The lodging-house was a large one, having at the time an average of about 100 male lodgers. Altogether, seventeen of these contracted the disease at intervals, as also a woman who had visited the house, before the infection was finally stamped out.

In January, 1904, whilst this outbreak was going on, the disease was again imported into the town, this time from Loughborough. A knife-grinder and his wife who, with two children, were tramping about the country arrived in Leicester and took a furnished room in connection with another lodging-house in Britannia Street. Shortly afterwards both the man and woman sickened with Smallpox and were removed to hospital. The woman had an abortive attack without eruption: the husband's attack was more severe.* It appeared that about a fortnight before they had been staying at a lodging-house in Loughborough where cases of Smallpox had recently occurred.

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* In our experience, it is rare for infection to be conveyed before the appearance of the eruption. We have had repeated instances of children attending school during the pre-eruptive stage without spread of the disease.

About the same time the disease broke out in Curzon Street. Here also the infection was presumably imported. The patient, a young man, had been staying in Nottingham just a fortnight previously, having walked there from Leicester in search of work. He gave the disease to his wife, who, though strongly advised, refused to be vaccinated.

Early in February the disease appeared at Aylestone, but the source of infection could not be traced. The outbreak resulted in six cases in three houses, and then died out.

About the same time two cases occurred in a lodging-house in Lee Street, and a third case was probably from the same source. Fortunately this outbreak went no further.

A little later in the month, February 27th, the disease was again imported from Loughborough by a female tramp who infected two other women living in Orchard Street, and simultaneously an Arab living in a lodging-house in Orchard Street was attacked, probably infected from the same source.

On February 12th, information was telephoned from Loughborough that the infant child of a woman who had been admitted to the Loughborough Smallpox Hospital had been brought by the grand-mother—a gipsy—to Leicester. The child was found with the grand-parents in a gipsy van on a vacant piece of land off Catherine Street. The Smallpox eruption was just appearing.† Two days later a man, living in Queen Mary Street, who had also been infected in Loughborough from the same source, was found to be suffering from the disease.

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* The man and his wife had both been vaccinated in infancy and also the elder child. The younger child was un-vaccinated. Both the children escaped. There is no evidence, however, that they were exposed to infection at the time the parents got infected, and after the parents developed the disease they were both vaccinated.

† The other occupants of the van, a gipsy man, his two "wives" and a son, were at once vaccinated. They were moved with the van to the Anstey Lane near the Hospital where they were kept under observation. No further case occurred.

From this time onward the disease became generalised and many cases occurred which could not be traced. The epidemic reached its maximum in April (as was also the case in 1903) and then declined as rapidly as it had increased. The highest number of cases occurring in any one week was 39 in the week ending Mar 31 April 5th. In the 1903 epidemic the weekly numbers twice rose above 50. The progress of the epidemic week by week is seen graphically in the accompanying chart. For comparison the corresponding curve for the 1903 epidemic is also given.

It will be noticed that there is a general similarity in the curves, and especially as regards the very remarkable exacerbation in April. It will be recollected that it was found impossible to satisfactorily account for this exacerbation in 1903, as practically none of the cases could be traced. In 1904, on the other hand, a majority of the cases could be traced to some previous case, and many of them were caused by "unrecognised" cases—very slight, apparently trivial cases (usually in vaccinated subjects)—which only came to light after they had spread the disease to others.

Brief particulars of each case that occurred during the epidemic will be found in Table F in the Appendix.

SCHOOL INFECTION.

In view of the fact that over 80 per cent. (probably nearly 90 per cent.) of the children attending the public elementary schools in Leicester have never been vaccinated, and that school attendance, as is well known, provides very favourable conditions for the spread of infection, it was certainly to have been expected that considerable spread of the disease would have occurred amongst children infected at school. Fortunately, however, such was not the case, for although during the course of the epidemic there were 58* school children attacked, yet only in 17 instances

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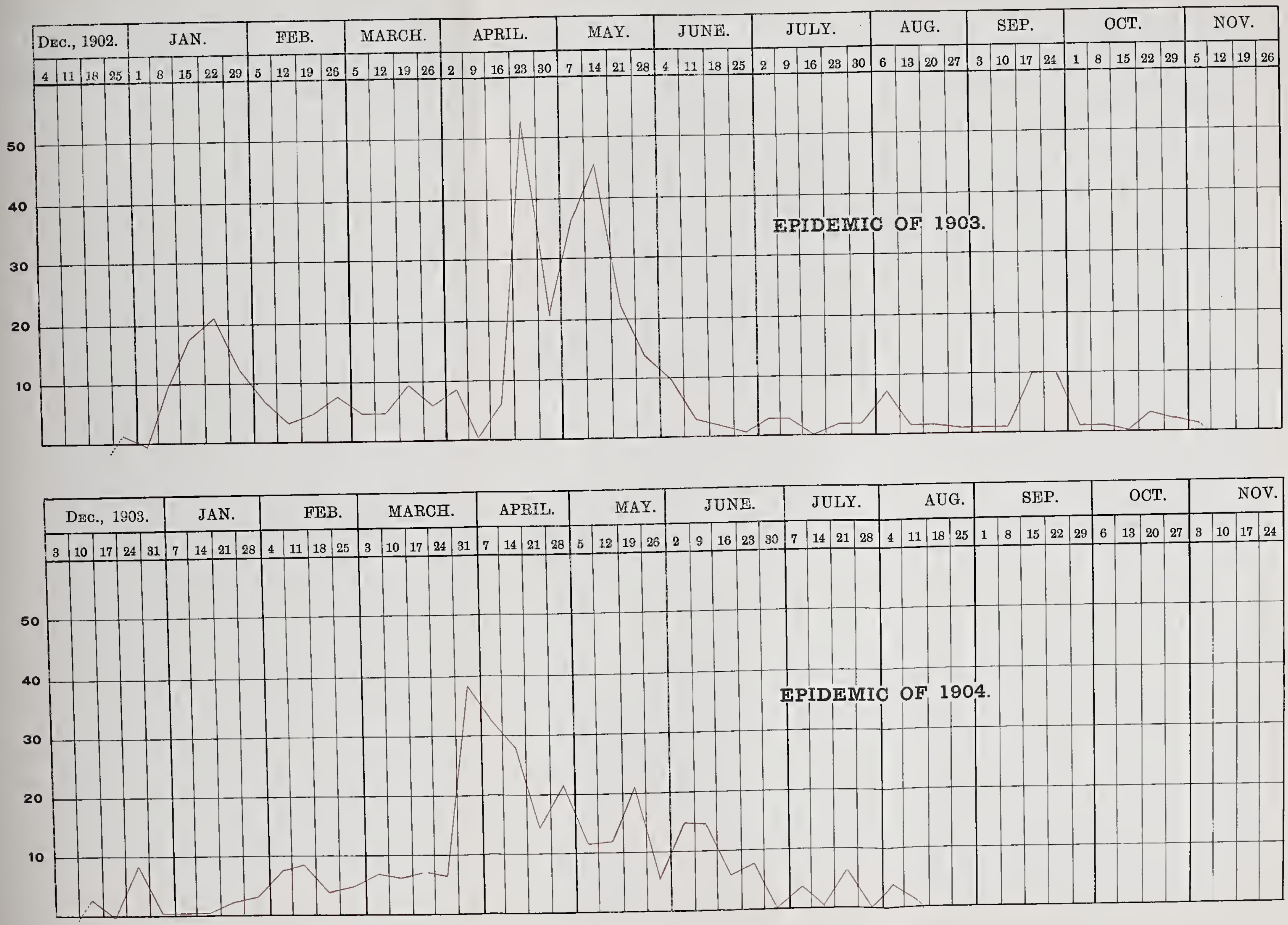
* This is exclusive of school children who were known contacts, for in such cases they were of course excluded from school attendance.

CHARTS showing number of cases of Smallpox occurring each week.



was there any reason to think that the infection had been received at school.

It will be recollected that in the 1903 epidemic there was also surprisingly little infection through the medium of schools. Thirty-six children were attending school at the time they were attacked yet only in nine instances was the source of infection traced to the school (page 48, 1903 Report). The experience of the 1892-3 epidemic appears to have been similar.

It will be understood, of course, from the above that the majority of the school children attacked were infected at home or elsewhere, but not at school.

The explanation I have to give of this fortunate escape—so different from what was expected—is as follows:—Smallpox is not infectious, speaking generally, during the incubation period. The onset is *sudden*, not insidious, so that as soon as an unvaccinated child sickens it at once becomes *too ill to attend school*. The case would be very different if a vaccinated child contracted the disease. In such cases the attack is almost always so slight and trifling in character that it might easily happen that it would escape detection and the child continue to attend school. In Leicester, however, the proportion of vaccinated children is so small that such a contingency has not yet happened. Should it ever occur the consequences would probably be disastrous. During the recent epidemic the disease was of so favourable a type that some of the unvaccinated cases assumed the highly modified and trivial character so often seen in vaccinated cases, and the possibility of such a case being overlooked and allowed to attend school caused me great anxiety.

THE SMALLPOX HOSPITAL.

The Leicester Borough Smallpox Hospital is situated in an isolated position on the Anstey Lane, one mile distant from the outskirts of the town and a quarter of a mile from the Groby Road Fever Hospital. The buildings are of wood and iron and provide accommodation for 60 patients. At the time of the outbreak the administrative portion of the hospital was incomplete, but this has since been remedied, new kitchen, laundry, and additional nurses' rooms having been added. In April, the number of cases under treatment went up to over 100, and this necessitated the use of the Groby Road Hospital for Smallpox. In anticipation of this necessity, fresh admissions of fever and diphtheria cases had been discontinued for some weeks previously, so that when the hospital came to be needed for Smallpox it was practically empty.* The Hospital remained closed to other diseases for three months. During this time I am pleased to be able to state that no increase occurred in the prevalence of the diseases usually treated there. This coincides with the experience of 1903, and I am satisfied, therefore, that the course adopted, viz., the utilization of the Groby Road Hospital for Smallpox, was wiser than attempting to deal with all the cases in the Anstey Lane Hospital, which would only have been possible by hastily putting up a number of emergency buildings which might never have been required again for many years. Moreover, the experience of most towns which have attempted to run up emergency buildings in the presence of a rapidly increasing epidemic has rarely been satisfactory and has sometimes failed altogether, as was notably the case at Gloucester, the epidemic increasing faster than the buildings could be put up. In the Groby Road Hospital, on the other hand, we had a fully equipped hospital already erected, with ample administrative accommodation, so that if the epidemic had spread and we had had to deal with even four times as many patients at one time as was actually the case no great difficulty would have been experienced.

One of the most fruitful causes of failure to control epidemics in towns where general vaccination of the population has fallen into disrepute, has been the absence of adequate hospital accommodation.

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* It will be recollected that in the previous year, 1903, when the Groby Road Hospital was required for Smallpox, a large number of fever and diphtheria patients had to be sent home at short notice.

THE SMALLPOX HOSPITAL STAFF.

The majority of the staff employed at the Smallpox Hospital in 1904 were the same as had acted during the 1903 epidemic. The total number of resident staff employed during the two epidemics was 74.

Everyone (with the exception of three who had already had Smallpox before being employed) *had been recently vaccinated.*

All the staff were more or less exposed to infection, but especially the nurses, 39 in number. As I stated in my previous report, they may be described as having been "literally steeped "in infection. They had to wash and feed the patients: to make "their beds and change their soiled linen: to dress their sores "and cleanse their mouths (often most offensive in bad cases): "to collect and burn the scabs (often in handfuls) that are shed "by the patients: and in the event of a fatal issue, to 'lay out' "the corpse. Many of them continued on Smallpox duty for "many weeks at a stretch without a break. Although the health "of the staff on the whole was good, there were times, as might "be expected from the arduous nature of their duties and the "close confinement, when they would feel 'run down' and be "specially liable, one would think, to contract any infection. At "the outset there was no question of their being 'seasoned' to "the disease because most of them (prior to 1903) had never "seen a case of Smallpox before." Yet although, during the two years, nearly 700 cases of Smallpox, of all degrees of severity, passed through the hospital, *not a single member of the staff contracted this most infectious disease.*

How is this remarkable immunity in the presence of such severe and continuous infection to be explained?

The explanation is that *recent vaccination confers specific protection against Smallpox.*

It has been suggested that this truly wonderful immunity was secured, not by vaccination, but by other means which were taken. I can only reply that as medical superintendent of the hospital and responsible for its management, I ought to know what precautionary measures were taken, and I say emphatically that *beyond vaccination no steps whatever* were taken to protect the staff. I knew that with efficient and recent vaccination no other measures were necessary, and that without it none would be of avail. It has been said that free ventilation of the wards and the use of disinfectants constitute a sufficient safeguard against Smallpox. Only those with no practical experience of the disease could think thus. In any case, I can say that in the Leicester hospital the use of disinfectants is practically confined to the time when the patients or nurses quit the hospital, whilst as regards ventilation, although this is undoubtedly very important for the sake of the patients and on general hygienic grounds, it would indeed be a broken reed to trust to in the case of nurses carrying out the duties detailed above.

I may mention here that two workmen temporarily employed upon some alterations at the Smallpox hospital, but who never entered the buildings occupied by patients, contracted the disease. Neither of them had been vaccinated since infancy.

As a contrast also to the immunity enjoyed by the staff during the recent epidemic, we have the experience of the 1892-3 epidemic. At that period six of the staff declined to submit to vaccination (not having been vaccinated since infancy) with the result that five of the six contracted the disease and one of them died.

THE TYPE OF THE DISEASE.

I have already referred to the mild and favourable type of the epidemic. As a result of this many of the cases which occurred were of a very slight and trivial description, the illness being of brief duration and the eruption scanty and quickly dying away. Some of the cases, indeed, were so very slight — the eruption being confined to a few "pimples" or absent altogether — that they were mistaken for cases of influenza. Such cases have been described as "varioloid," though the name is not a good one as it is liable to convey the impression that they are not true Smallpox, which they undoubtedly are as is proved unmistakably by the spread of infection to others.

These cases of "abortive" Smallpox are much more common in persons who have been vaccinated (many years before) than in the unvaccinated, though it is certainly the case that they may *sometimes* occur (in very benign epidemics such as we are now considering) in persons who have never been vaccinated. An interesting paper describing a number of these cases and illustrated by photographs has been published* by Dr. Allan Warner, Assistant Medical Officer of Health for Leicester. It should be clearly understood, however, that these cases occurring in unvaccinated subjects were quite exceptional. The great majority of the unvaccinated cases were definite, easily recognised attacks.

I am referring later to the mischief that is apt to be caused by very slight cases if their real nature should not be recognised.

In the case of several of the vaccinated patients the symptoms of the disease when first admitted to hospital were so slight or so atypical that it was thought desirable as a precautionary measure to apply the vaccine test. In the absence of complete isolation wards this is the only safe course to adopt if these cases are to be removed to hospital, which it is very important in the public interest that they should be. In all cases the consent of the patients or their friends was first obtained.

DETAILS OF THE FATAL CASES.

The particulars of the four† cases which proved fatal are as follows:—

No. 44. William B., aged 46, a man of broken-down constitution whose wife had left him on account of his drunken habits.

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* *The Practitioner*, October, 1904.

† The Registrar General records *five* deaths. The particulars of the supposed fifth case are as follows: Grace K, an un-vaccinated baby *only 16 days old*, was admitted to Hospital on April 22nd, 1904, suffering from Smallpox. The attack was not a severe one, and in spite of the child's tender age she made an excellent recovery. Special care was taken as regards the feeding of the infant with the result that she throve remarkably whilst in hospital. I am told that she was never sick once. On May 21st

He had a severe confluent attack. He stated positively that he had been vaccinated in infancy. There were no vaccination marks on his left arm, but on the right arm lower down than usual were two very indistinct marks which may or may not have been vaccination scars. Although classed as vaccinated the evidence that the man ever had been vaccinated can scarcely be regarded as conclusive. His parents being dead no confirmation of his statement could be obtained from them.

No. 133. Sarah T., aged 8, unvaccinated. The attack was a malignant one and proved fatal in six days.

No. 209. John H., aged 5 weeks. Unvaccinated. Had a coherent attack.

No. 220. Mary C., aged 5, unvaccinated. Had a confluent attack. This case did not belong to Leicester and was not infected in Leicester. Her parents were tramping from Manchester to London and the child was taken ill only a few days

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she was discharged and was handed over to her mother "looking the picture of health." Unfortunately for the child, she left an institution where she was receiving special care and attention for a poverty-stricken home where there were *eight more children*, only three of them being over twelve years of age. Such a change of environment was more than the poor infant could endure. Within a few days of returning home she began to waste rapidly away, and within a fortnight she was dead!

The medical man who was called in certified the death, without comment, as due to "variola." The symptoms, however, which were of a negative character, suggested marasmus, and the medical man, having his attention drawn to the facts of the case, sent in an amended certificate of "marasmus following variola."

I wrote to the Registrar General, laying the facts fully before him, and stating emphatically that I did not think it would be at all correct to ascribe the death to Smallpox.

I received a formal acknowledgment thanking me for the information sent and saying that the facts should be noted. In spite of this, however, the death was classified as due to Smallpox!

Personally, I am quite satisfied that the death cannot fairly be ascribed to Smallpox, but was undoubtedly due to the unfavourable surroundings and method of feeding at home. I think it is most probable that in such surroundings the child would never have lived in any case.

If a vaccinated child had died from marasmus under similar conditions, after it had been discharged from hospital cured, I think most medical men would agree that it would be unfair to ascribe the death to Smallpox. Therefore I cannot regard it as fair that this death should be so ascribed.

after reaching Leicester. She was apparently infected somewhere in the neighbourhood of Burton-on-Trent, where they were staying a fortnight previously.

THE COST OF THE EPIDEMIC.

The chief item in the cost of the epidemic to the town was the expense of treating the patients in hospital. It is impossible to state this exactly as separate accounts are not kept for each disease treated at the hospital. I believe, however, that if an allowance of £1 per week per patient be made, it would be a fair estimate, and on this basis the cost of treating the 306 patients who were removed to hospital (the mean stay in hospital being 29·6 days) works out at £1294.

The next item in importance was the amount paid in compensation to contacts for staying away from work, viz., £177.

There was also £60 given in gratuities to the Sanitary Staff for extra work entailed by the epidemic; and the cost of disinfecting, cab hire, and sundries, may be put down at another £100.

We ought also to include the cost of vaccinating contacts, say £130, for nearly the whole of this had to be paid for out of the rates, though not through the Corporation.

This brings up the total money cost of the epidemic to £1761.

The loss of life caused by the epidemic was astonishingly small. There were only four deaths, one a man of broken-down constitution and drunken habits, and three children: one of the latter was a baby five weeks old, and one was the child of a tramp. The last case as stated above did not belong to Leicester, and was not infected in Leicester, so that this death might fairly be deducted.

There was also, I am pleased to say, very little permanent disfigurement or injury produced by the disease in those who recovered, the great majority showing no scarring whatever.

On the whole, therefore, Leicester is certainly to be congratulated on having once again escaped so lightly. Whether she will always be so fortunate time alone will reveal. To prophesy good is as great a mistake as to prophesy evil!

PART II.

STATISTICS OF THE 1904 EPIDEMIC.

CLASSIFICATION OF THE CASES AND DEATHS, AS REGARDS VACCINATION.

The following table shows the proportion of vaccinated and unvaccinated cases, and the relative fatality:—

		Cases.	Deaths.	Fatality per cent.
Vaccinated	...	127	1*	
Unvaccinated	...	192	3	
Uncertain	...	2	...	
Total	...	321	4	1·24

Twenty-one of the unvaccinated and four of the vaccinated cases were vaccinated during the incubation period (see Table B).

One of the vaccinated cases and one of the unvaccinated cases had previously suffered from Smallpox (cases 41 and 191). Four of the vaccinated cases had been re-vaccinated.

As regards the two cases classed as uncertain, one, No. 32, was a severe case in an Arab. No vaccination marks could be discovered, and neither the patient nor his friends had any idea whether he had been vaccinated or not. The other case, No. 154, was a very mild case in a girl of 18, whose mother was dead. No vaccination marks could be discovered. The father "thought" she had been vaccinated, but could not be sure.

In one of the vaccinated cases there was doubt if the case really was Smallpox.

The following are the corresponding statistics of the 1903 epidemic:—

		Cases.	Deaths.	Fatality per cent.
Vaccinated	...	194	4	2.06
Unvaccinated	...	198	16	8.08
Uncertain	...	2	1	...
Total	...	394	21	5·33

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* See remarks about vaccination of this case on page 18.

In case it should be desired to treat the epidemics of 1903 and 1904 as all one outbreak, the following table shows the figures for the two epidemics combined:—

Smallpox in Leicester (December 1902 to August 1904).

		Cases.	Deaths.	Fatality per cent.
Vaccinated	...	321	5	1·55
Unvaccinated	...	390	19	4·87
Uncertain	...	4	1	...
Total	...	715	25	3·49

THE VACCINATION OF CONTACTS.

This is an aspect of the vaccination question to which close attention has been paid in both epidemics. No pains were spared to persuade as many as possible of the inmates of the invaded houses to submit to vaccination. Our experience proves that when the first case in a house is recognised *early*, and the other inmates at once submit to vaccination, there is very small risk of any of them developing the disease, even though they may never have been vaccinated previously. This aspect of the subject was dealt with very fully in my previous report.

The total number of invaded houses during the epidemic (exclusive of the Workhouse and lodging-houses) was 174.

The number of inmates of these houses (exclusive of the persons first attacked) was 823.

Of these, 111 persons, or 13·4 per cent., were subsequently attacked.

It is very necessary, however, to distinguish between the houses in which the first case was recognised, and therefore removed to hospital and other precautions taken, and those in which the first case was un-recognised.*

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* As before, I have reckoned as un-recognised those cases in which the nature of the attack was not recognised until the eruption had been out for at least a week.

TABLE I.

	No. of Houses.	No. of other Inmates.	No. who contracted Smallpox.	Attack Rate per cent.
(1) First case recognised ...	162	746	62	8·3
(2) First case unrecognised	12	77	49	63·6
Total ...	174	823	111	13·4

The above table shows the terrible consequences which follow when the first case of Smallpox in a house is not recognised.

In the case of the houses in which the first case was recognised, a very small proportion of the other inmates contracted the disease. This was due to two causes. In the first place immediately a case was recognised as Smallpox it was removed to hospital and the source of infection thereby removed. Secondly, the great majority of the other inmates submitted to vaccination. The effect of this is shown below.

TABLE II.

(CORRESPONDS TO TABLE III., PAGE 58, IN 1903 REPORT.)

Houses where first case was recognised and removed to Hospital.

	No. of Persons.	No. who contracted Smallpox.	Attack Rate per cent.
(1) Inmates who got vaccinated after occurrence of first case of Smallpox	533	26	4·8
(2) Inmates who did not get vaccinated after occurrence of first case ...	174	36	20·6
Total ...	707*	62	

From this it is seen that those inmates who did not submit to vaccination after the occurrence of the first case in a house were attacked *four times as heavily* as those who did submit. This is quite irrespective of their previous vaccinal condition.

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* This is exclusive of 39 inmates, 24 of whom had already had Smallpox. 11 had been recently vaccinated, and in four cases precise information was wanting.

It is noteworthy, however, that even those who did not get vaccinated suffered very much less than the inmates of the houses where the first case was unrecognised and therefore not isolated. See Table I. (2).

Of these latter, no less than 63·6 per cent. were attacked.

It is interesting to consider the vaccinal condition of these persons prior to exposure to infection. This is shown below.

TABLE III.

Vaccinal condition of other inmates of houses in which the first cases of Smallpox was not recognised.

	No. of Inmates.	No. who contracted Smallpox.	Attack Rate per cent.
Vaccinated ... ... (mostly in infancy.)	31	13	41·9
Unvaccinated ...	45	36	80·0
Already had Smallpox	1	...	...
Total ...	77	49	63·6

The above table corresponds to Table VI. (3) in the 1903 Report, page 64. The corresponding attack-rates then were 50·0 per cent., and 79·4 per cent. In both epidemics the unvaccinated were attacked in far greater proportion than the vaccinated, though even the latter suffered very heavily.

THE AMOUNT OF VACCINATION PERFORMED IN LEICESTER DURING THE EPIDEMIC.

Although the actual number of Smallpox cases occurring in 1904 was not very far short of the number occurring in the previous year (viz., 321 against 394) there was a marked falling off in the amount of vaccination performed. This is shown by the following figures:—

Year.	Primary Vaccinations Registered.	Revaccinations performed by Public Vaccinators.	Total.
1903	2487	1456	3943
1904	1282	263	1545

In neither case are re-vaccinations performed by private practitioners included, the number being unknown. From what I could learn, however, the amount was very small except amongst the better classes.

The explanation of this decline is that in 1904 the public had become accustomed to the presence of the disease in the town, and very little alarm was felt. The exceptionally mild type of the disease probably also contributed to this.

The number of primary vaccinations registered in the different quarters of the year was as follows:—

Primary Vaccinations Registered.

	First Quarter.	Second Quarter.	Third Quarter.	Fourth Quarter.
1903	491	1427	292	277
1904	298	546	253	185

The following table shows the number of vaccinations in the past ten years:—

Year.	Primary Vaccinations Registered.	Year.	Primary Vaccinations Registered.
1894	133	1900	343
1895	75	1901	357
1896	86	1902	1237
1897	81	1903	2487
1898	92	1904	1282
1899	156		

RE-VACCINATION.

Only four of the cases stated that they had been re-vaccinated; this is exclusive, of course, of vaccinated persons vaccinated again during the incubation period. The interval between the re-vaccination and the attack of Smallpox was (as nearly as could be ascertained) as follows:—48 years, 33 years, 36 years, and 30 years; and the character of the attacks was in two cases discrete, and in two mild discrete.

During the 1903 epidemic, the number of re-vaccinated cases was eleven, giving a total of fifteen unvaccinated cases for the two epidemics out of 715 cases of Smallpox.

A reliable clue to the proportion of re-vaccinated persons in the population of Leicester in those districts invaded by Smallpox is obtained from the proportion of re-vaccinated persons found to exist amongst the other inmates of invaded houses. The vaccinal condition of the other inmates was in all cases recorded with special care. Taking the two epidemics together, I find that amongst 1907 inmates of invaded houses (excluding the persons first attacked) 93 had been re-vaccinated at some time or other in their lives prior to the outbreak of the disease. This is equivalent to 4·9 per cent. Yet out of the 715 cases of Smallpox which occurred only 15 had been re-vaccinated, or 2·1 per cent. That is to say, 4·9 per cent. of the inmates of invaded houses had been re-vaccinated (at some time in their lives), but only 2·1 per cent. had been re-vaccinated of the persons attacked.

VACCINAL CONDITION OF THE POPULATION OF LEICESTER.

In my previous report, I referred to an investigation I had had made as to the vaccinal condition of the population living in those districts of the town where Smallpox had prevailed. From this I found that of 4946 persons living in 1056 houses in 22 streets, prior to the epidemic, nearly 62 per cent. had been vaccinated, 35 per cent. were unvaccinated, and nearly 3 per cent. had had Smallpox.

Vaccinal condition of Population.

Houses visited 1056.	No. of Inmates.	Proportion of whole.
Vaccinated persons ...	... 3053	61·7
Unvaccinated persons ...	... 1748	35·3
Had Smallpox ...	... 145	2·9
	4946	100·0

Perhaps, however, the most reliable clue to the true vaccinal condition of the inhabitants of the invaded districts is the vaccinal condition of the other inmates of the invaded houses.

Vaccinal Condition of Inmates of Invaded Houses. 1904 Epidemic.

In 174 private houses invaded by Smallpox there were living 823 inmates, exclusive of the persons first attacked.

Their vaccinal condition prior to the outbreak was as follows :

	No. of Inmates.	Proportion of whole.
Vaccinated*	353	42·9
Unvaccinated	431	52·3
Had Smallpox	27	3·3
Uncertain	12	1·4
	823	100·0

* Of these, 28 had been re-vaccinated.

The corresponding figures for the 1903 Epidemic were as follows :—

1903 Epidemic.

Number of Invaded Houses, 233 (exclusive of 18 houses where the first case was not recognised).

	No. of Inmates.	Proportion of whole.
Vaccinated†	525	48·4
Unvaccinated	495	45·6
Had Smallpox	51	4·7
Uncertain	13	1·2
	1084	100·0

† Of these, 65 had been re-vaccinated.

Both Epidemics Combined.—1903 and 1904.

	No. of Inmates.	Proportion of whole.
Vaccinated persons ...	785	41·5
Re-vaccinated	93	4·9
Unvaccinated	926	48·5
Had Smallpox	78	4·0
Uncertain	25	1·3
	1907	100·0

It is interesting to compare with the above table the vaccinal condition of the persons actually attacked by Smallpox, and who were living in the same houses.

Vaccinal Condition of Persons Attacked.—Epidemics of 1903 and 1904, combined.

	No. of Cases.	Proportion of whole.
Vaccinated Persons ...	304	42·5
Re-vaccinated	15	2·1
Unvaccinated	389	54·4
Previous Smallpox ...	3	·4
Uncertain	4	·5
	715	100·0

By a comparison between these two tables we obtain an insight into the relative incidence of the disease upon the vaccinated, the re-vaccinated, and the unvaccinated respectively. It is important, however, to remember that in Leicester where vaccination has fallen so largely into disfavour, "vaccinated persons" means, with few exceptions, adults vaccinated in infancy. So also as regards the re-vaccinated class. The great majority of these were persons re-vaccinated very many years ago. Many of them were ex-soldiers, who had been re-vaccinated on entering the army. There are very few recently vaccinated persons in Leicester.

PART III.

GENERAL.

THE VACCINATION CONTROVERSY.

It is permissible in a report such as this, after recording facts, to express an opinion upon debatable questions arising out of those facts.

Moreover, I feel that I have now some right to express an opinion on questions concerning Smallpox and Vaccination, for in addition to my experience of Smallpox in Birmingham in 1892-3, I have had, as your Medical Officer of Health, intimate experience of upwards of 700 cases of Smallpox in Leicester. Each of these cases has been closely investigated on the spot; the source of infection and vaccinal condition have been inquired into: the progress and development of the cases after removal to hospital have been studied day by day: and the subsequent history of all contacts has been carefully watched.

For the whole time, indeed, that the disease has been epidemic in the Borough the subject of Smallpox and Vaccination has engrossed my time and attention.

In the first place, then, I believe that the real crux of the vaccination controversy will be, in the future, the question of compulsion. Yet hitherto the battle has chiefly raged round the question of efficacy. Both sides seem to have regarded the latter question as the only key to the position, and almost every debate on vaccination quickly resolves itself into a furious attack and defence of this one salient point.

I wish to say frankly that my whole experience (and I suppose experience counts for something) convinces me that the anti-vaccinists in trying to disprove that vaccination confers specific protection against Smallpox are leading an utterly forlorn hope. This particular position of the vaccinists is, I am certain, quite impregnable.

But I do not think that it necessarily follows from this that the battle is quite over. There is an alternate line of attack open to the opponents of vaccination, viz., to contend that under modern conditions, in a civilised community, compulsory vaccination is not absolutely necessary for the control of Smallpox and the safety of the community (such supposed necessity being the ground on which the plea for compulsion was originally based).

As the Medical Officer of Health for Northampton (Dr. Beatty) has recently pointed out,* this contention may be wrong, but it is at least a defensible position, and I agree with him that this is the line of argument on which those who cannot reconcile themselves to compulsory vaccination would be wise to rely. I am quite sure that it is, to say the least of it, a bad error of tactics to attempt to overthrow compulsory vaccination on the ground that vaccination does not, and cannot, protect against Smallpox. Those who attempt to do so are only wasting their strength, and are beating their heads against a rock—the rock of hard fact.

The cause of anti-vaccination will never make any real progress until the untenable position of denying the protective power of vaccination is finally abandoned. I do not say that it will make very much progress even then, but any progress it may appear to make at present cannot be true progress for it is based upon a fundamental error.

Few will deny that exaggerated claims on behalf of vaccination were made in the past. Perhaps not all of these have even yet been abandoned. Such exaggerated claims have undoubtedly been largely responsible for calling the anti-vaccination movement into existence, and this movement has certainly helped to lead to their exposure.

It does not follow, however, that vaccination is therefore a "myth," or a "monstrous delusion," or an "obsolete fad," as many anti-vaccinists appear to believe.

It has often happened that in controversial questions the truth has ultimately been found to lie between the two extremes. It may well be that we shall eventually recognise that the whole truth about vaccination does not rest with either the vaccinists or the anti-vaccinists. Yet, strange to say, there are comparatively few at present who seem to realize that any intermediate position on the vaccination question is possible.

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* Annual Report, Northampton, 1903.

If I were called upon to express my own views on the question in a brief sentence I would say that whilst I am quite satisfied that a *complete* system of repeated vaccination and re-vaccination strictly enforced would certainly eradicate Smallpox, I am not at all satisfied that such a system is really necessary or even practicable. As for the present incomplete system of single vaccination, its total effect is so uncertain that to attempt to enforce it strictly is both unnecessary and unwise.

SMALLPOX AND SCARLET FEVER MORTALITY IN LEICESTER.—A COMPARISON.

The annexed diagram represents the annual mortality from Smallpox and Scarlet Fever in Leicester during the past 66 years.

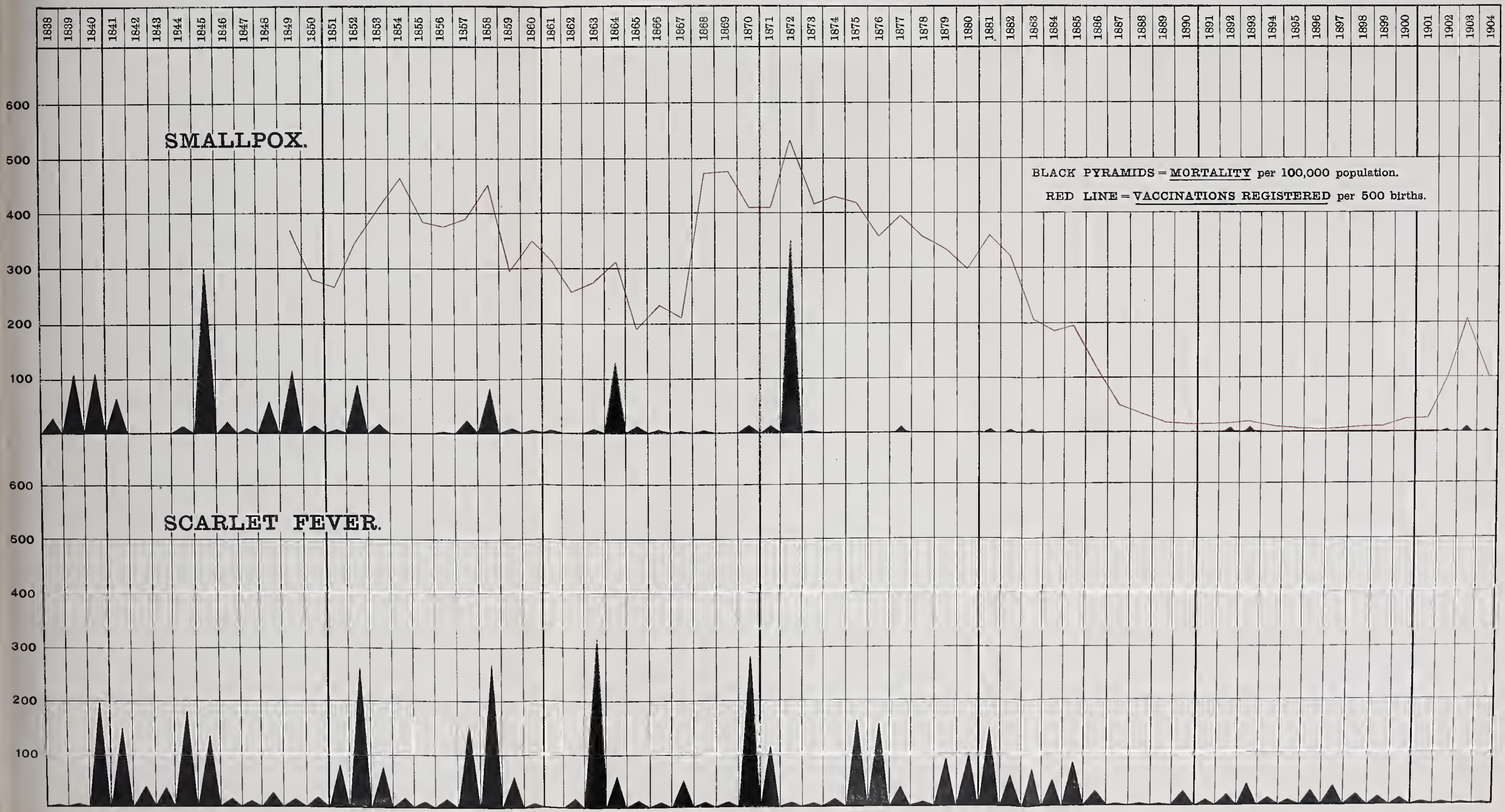
A comparison between these two diseases is instructive. Both diseases belong to the group of Acute Zymotics. Both diseases resemble each other in the manner of spreading, the principal mode of infection (it is believed) being direct from person to person. In both, the mortality was formerly very excessive, these two diseases being the most dreaded, probably, of all the exanthematous group. In both, the mortality has dropped during the past 30 years, until at the present day it is almost a negligible quantity as regards its effect upon the general mortality.

The idea naturally presents itself that this striking decrease in mortality in two diseases in the same group, coinciding so closely in point of time, may be due, in part at least, to some common, or at least similar, cause.

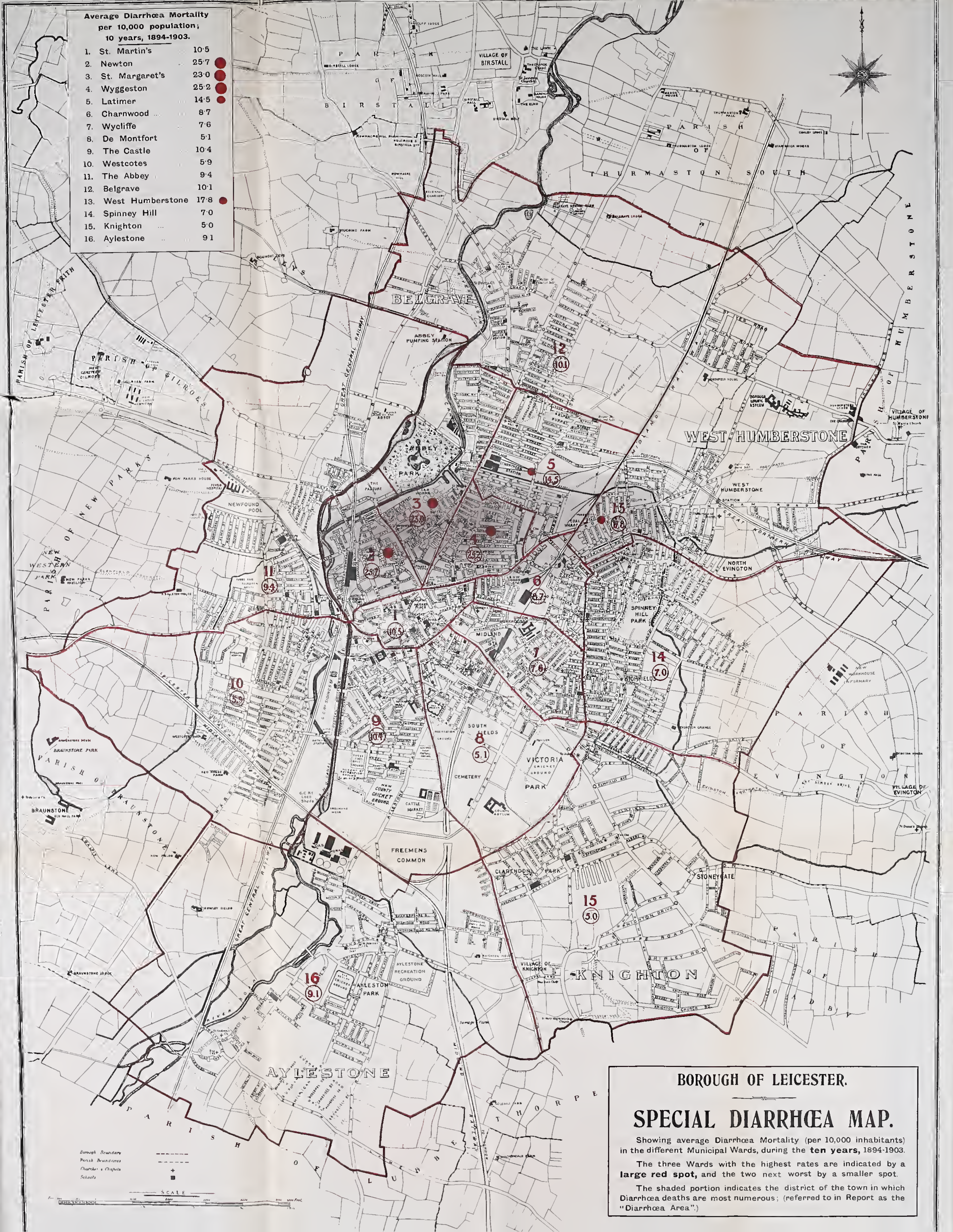
In the case of Scarlet Fever we are unable to state precisely what the cause is that has led to so notable a decrease in mortality, but clearly we cannot ascribe it to vaccination.

It is conceivable, then, that the theory usually put forward to account for the decrease in Smallpox mortality, viz., that it is the result of the extension of vaccination, though certainly attractive, may have to be qualified. A part of the reduction

DIAGRAM showing Smallpox and Scarlet Fever Mortality in Leicester, 1838-1904.



The figures from which this Diagram is drawn are, for the years prior to 1890, taken from the Tables in Append. 3, Fourth Rep. R.C.V., prepared and handed in by Mr. J. T. Biggs.



Average Diarrhœa Mortality per 10,000 population; 10 years, 1894-1903.

1.	St. Martin's	10·5	
2.	Newton	25·7	●
3.	St. Margaret's	23·0	●
4.	Wyggeston	25·2	●
5.	Latimer	14·5	●
6.	Charnwood	8·7	
7.	Wycliffe	7·6	
8.	De Montfort	5·1	
9.	The Castle	10·4	
10.	Westcotes	5·9	
11.	The Abbey	9·4	
12.	Belgrave	10·1	
13.	West Humberstone	17·8	●
14.	Spinney Hill	7·0	
15.	Knighton	5·0	
16.	Aylestone	9·1	

BOROUGH OF LEICESTER.

SPECIAL DIARRHŒA MAP.

Showing average Diarrhœa Mortality (per 10,000 inhabitants) in the different Municipal Wards, during the **ten years**, 1894-1903.

The three Wards with the highest rates are indicated by a **large red spot,** and the two next worst by a smaller spot.

The shaded portion indicates the district of the town in which Diarrhœa deaths are most numerous; (referred to in Report as the "Diarrhœa Area".)

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may be due to vaccination, as I personally believe it must have been, but considerable allowance may also have to be made for other influences. It would be reasonable, indeed, to assume that even if vaccination had never been discovered, a very considerable reduction in Smallpox mortality might nevertheless have taken place, just as we see has happened in the case of Scarlet Fever.

If it be admitted, however, that other influences besides vaccination have been at work to account for the reduction in Smallpox mortality, then we must obviously be careful as to how much of this reduction we claim as the effect of vaccination. It must, indeed, materially affect our estimate of the total service of vaccination to the present generation.

The diagram also indicates the number of primary vaccinations registered (in proportion to births) each year in Leicester and it is at once obvious that concurrently with the decrease in the mortality from Smallpox there has been a very notable diminution in the amount of vaccination. This is an additional and very potent argument against the contention that the decrease in Smallpox mortality is entirely due to the effect of vaccination.

This latter aspect of the question was discussed in my Smallpox Report for 1903, page 8.

THE SPREAD OF SMALLPOX BY "OVERLOOKED" OR "UNRECOGNISED" CASES.

There is one aspect of the vaccination question which I think merits closer attention and consideration than it has hitherto received.

It is now becoming generally recognised that one of the greatest difficulties in the way of preventing the spread of infectious disease is the occurrence of very slight cases which escape detection and in which, therefore, no precautions can be taken.

In the case of Scarlet Fever the occurrence of these slight unrecognised cases has frequently been put forward as largely explaining the failure of hospital isolation to control this disease.

The same is true as regards Diphtheria. Thus, the Medical Officer of Health for Bristol, in his Annual Report for 1903, page 41, writes: —"Diphtheria is now known to be a disease chiefly, if "not entirely, spread by personal contact: and to be *kept alive* "*very largely by the unsuspected mild cases* where the throat "or nose affection is so slight as to pass unnoticed."

The *British Medical Journal* (September 10th, 1904) in summarising the above report wrote (referring to pseudo-bacilli): "Their frequent appearance in both stages of throat Diphtheria, "and their constant occurrence amongst contacts with clinical "Diphtheria (especially in schools), leads us to attach serious "importance to them when found in intimate association with "an outbreak of recognised Diphtheria, and to ascribe to them "in such association the rôle common to the mildest form of "Scarlet Fever or of Smallpox—that is, *of keeping alive an* "*infection which, if marked clinical cases alone occurred, might* "*readily be blotted out.*"

There is little doubt that what is true of Scarlet Fever and Diphtheria is also true in the case of Smallpox, and that it is the occurrence of slight unrecognised cases which to a large extent keeps an epidemic alive.

We have, unfortunately, had repeated experience of this in Leicester. I gave numerous instances in my report on the epidemic of 1903, and the same thing happened over and over again during 1904. To give details would only be tedious, but I may mention that to five of these slight overlooked cases occurring in the short space of four weeks no less than 40 other cases were traced.

Nor is this experience in any way peculiar to Leicester. From all parts of the country come reports of outbreaks of Smallpox, often serious, originating or spread by cases so slight that their real nature had at first been overlooked.

The Medical Officer of Health for Battersea in his Annual Report for 1902 (page 77), writing of Smallpox said:—"The "spread of the disease was very largely due to unrecognised or "concealed cases. *This is the usual experience, and constitutes* "*the chief difficulty in dealing with an outbreak of Smallpox.*

"In some cases the disease was of so mild a type that the patient "thought he had merely caught a "heavy cold," and, not troubling "to see a doctor, went about his work after a few days at home "as if nothing had happened."

In a Report made to the Derbyshire County Council by its Public Health Committee in July of last year it was stated:—"The disease (Smallpox), however, is of a very mild type, and a "considerable number of persons are affected without being "sufficiently ill to take to their beds or call in medical advice. "*On this account it is most difficult to stamp out the epidemic.*"

The Medical Officer of Health for Carlisle in his Annual Report for 1903 (page 27), writes:—"A very remarkable and "important feature of the outbreak was the extreme mildness of "many of the cases. In several instances the disease was so "little marked as to escape recognition until a late period of "convalescence when, as a result of an examination of all the "inmates of the infected houses, the cases were detected. *Such "cases were invariably associated with efficient vaccination* in "the person in whom they occurred, thus bearing impressive "evidence of the power of vaccination in mitigating the severity "of Smallpox. The modified character of many of the cases "*increased the difficulty in dealing with the outbreak*, inasmuch "as many of the patients had freely mixed with people for the "greater part of a week before the cases came under observation."

The italics in the above quotations are my own.

My next point is that *the great majority* of these very slight cases, which so easily escape detection and which are the cause of so much trouble and make it so difficult to stamp out Smallpox, occur *in vaccinated persons;* not recently vaccinated, of course—these do not take Smallpox at all—but persons vaccinated many years before, (*e.g.*, young persons or adults vaccinated in infancy) *i.e.*, the class who make up the bulk of the population in a vaccinated community.

It is scarcely necessary to insist on this point for almost every vaccinist recognises the truth of it, but I will just quote from one authority, the late Mr. Ernest Hart.*

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* Allbutt's System of Medicine, first edition.

"But it should be borne in mind that in those cases in which "Smallpox occurs after vaccination the disease is, almost without "exception, so far modified that its identity in its earliest stages "is frequently unrecognised. . . . . In Blackburn, the Medical "Officer of Health met with a number of cases of Smallpox in "vaccinated persons where the disease was so far modified that "the patients went about their work without being aware of the "nature of the illness that was upon them."

Smallpox in the unvaccinated, on the other hand is, nearly always a disease presenting well-marked clinical features: the patient is sufficiently ill to necessitate a medical man being called in, and the real nature of the disease can be recognised early in the attack. It is a well-known fact that the vast majority of mistakes in diagnosis occur in the case of vaccinated subjects.

Smallpox is undoubtedly a disease which responds, so to speak, to active preventive measures, such as hospital isolation, etc.: more so probably than any of the other zymotic diseases with which we have to deal in this country; but unless the nature of the disease is recognised these preventive measures are obviously useless, because they cannot be put into operation.

We have, then, to face the fact that vaccination, in spite of the great assistance which *recent* vaccination undoubtedly renders us in fighting Smallpox, may, under certain circumstances, actually conduce to the spread of the disease.

SMALLPOX AND VAGRANCY.

The part played by vagrants in spreading Smallpox has often been insisted upon, and there is little doubt that they played some part in the recent epidemic in Leicester. The number of outbreaks of the disease in common lodging-houses certainly points to this.

The pernicious and unhygienic habits and life of tramps render them specially liable to contract the disease, while (and this is even more important) their nomadic habits and absence of fixed abode make it peculiarly difficult to deal with them when the disease does occur amongst them. For example, the method of quarantining contacts in their own homes which answers so well in the case of ordinary citizens is almost useless in the case of a lodging-house full of men who are here to-day and perhaps gone to-morrow, leaving no reliable name or address behind.

So important is this question of vagrancy and Smallpox coming to be regarded that a special conference of sanitary authorities, convened by the London County Council, was held in London last summer to consider the subject, and to discuss the best measures for dealing with it.

Many remedies were suggested, including one for the compulsory re-vaccination of the professional tramp.

There is a great deal to be said in favour of such a proposal, and personally I should like to see such a measure put into operation before the much more drastic measure of universal re-vaccination is attempted.

If it can be shown, as I am satisfied that it can, that the vagrant class are exceptionally liable to spread Smallpox, then that is a sufficient reason, on the ground of justice, for treating them differently from the rest of the community. Moreover the principle of making re-vaccination compulsory for certain sections of the community is already recognised, *e.g.*, in some of the public services.

It has been objected that the suggestion is impracticable but personally I believe there would be no insuperable difficulty in securing the re-vaccination of the great majority of those who apply for shelter at the casual wards of our workhouses. A system of certificates could be devised (many tramps already carry pedlars' certificates), and every tramp not provided with a certificate showing that he had already been re-vaccinated could be required to undergo the operation. In the event of temporary disablement caused by such vaccination, a liberal compensation allowance should be granted.

I am aware of course that many of those who are opposed to vaccination on principle would object to this suggestion of re-vaccination of tramps, but they would have much greater cause for objection if the Re-vaccination Bill now before Parliament, which provides for universal re-vaccination, were to become law!

Personally, I believe that a law of universal re-vaccination, even though providing for a single re-vaccination only, would have a very great effect in diminishing Smallpox, but I am not satisfied, as I have said before, that it is really necessary, and I recognise that it would be a very drastic law, and that there would be some very serious drawbacks, for vaccination is by no means the trivial operation it is sometimes represented to be. Hence, I feel that all other possible means for controlling the disease should be given a fair and thorough trial before universal re-vaccination is resorted to.

THE FATALITY OF SMALLPOX IN PRE-VACCINATION TIMES.

The unexpectedly low fatality of Smallpox in 1892 and 1893, and now again in 1903 and 1904, in a comparatively unvaccinated town like Leicester, raises the question as to the true fatality of the disease before the days of vaccination. This is rather a debated point, and there are insufficient data available to enable a precise conclusion to be arrived at. There is reason to think, however, that the average fatality of Smallpox in pre-vaccination times has, by some, been rather over-estimated. Quite recently a responsible medical writer gave it as 25 per cent., whilst another stated positively that it was 30 to 40 per cent!

There can be little doubt that these terrible proportions were sometimes reached, but there seems no sufficient evidence that the *average* fatality was nearly as high as this, and, indeed, it is scarcely credible that it could have been. Certainly, had such a fatality prevailed in London in the eighteenth century, when the disease was so prevalent that almost everyone suffered from it, the Bills of Mortality must have revealed a higher *mortality* than two to four per thousand population. It seems reasonable to suppose that in some epidemics a very low fatality prevailed, such as the recent one in Leicester (in which, as I have shown, the fatality amongst the unvaccinated was less than two per cent. of the cases), and thus brought down the average. Jurin's statistics, collected in the eighteenth century, show a fatality of 16·6 per cent., which is probably a fair average.

This point is of considerable importance, because obviously it affects our estimate of what the probable average fatality of Smallpox would be should the disease occur at the present day in an entirely unvaccinated community.

THE "LEICESTER METHOD."

As regards the "Leicester Method," I will say at once that I consider it is too soon yet to arrive at a final conclusion as to its value. Hitherto it has undoubtedly been successful beyond expectation, but it may yet break down and reverse earlier experiences. It must be admitted, however, that the results already achieved seem to indicate, in spite of all that has been said and written to the contrary, that it may be possible, in a civilised community, living under favourable circumstances (as regards congestion of population, etc.) and with a thoroughly efficient sanitary organisation, to effectively control Smallpox even though the general population be unvaccinated.

The question, too, would be greatly simplified if the vagrancy problem were satisfactorily solved.

The experiment, unfortunately, involves risk, but this risk would be minimised if the opposition to and want of faith in vaccination—largely engendered by compulsion—could be overcome, so that in the event of a breakdown of the experiment, universal vaccination could still be resorted to, and a disaster averted: for I firmly believe that any epidemic of Smallpox could be cut short provided the whole population in the affected districts were ready and willing to submit to immediate vaccination.

Leicester's danger, as it seems to me, lies in the fact that the popular feeling against vaccination is so strong that if a breakdown of the present system did occur, it is unlikely that the people would submit to universal vaccination until a very serious catastrophe had occurred.

I believe that the introduction of an amended conscience clause (in which the discretionary magisterial powers, at present so greatly abused, and the cause of so much irritation and friction, were omitted) would do much to allay hostility and opposition, and bring about a fairer and more rational attitude—on both sides.

I fear there are some who would like to see the conscience clause entirely withdrawn, and stringent and uncompromising compulsion again introduced—who would like to see the vaccination of every infant again rigorously enforced irrespective of the feelings or wishes of its parents—its lawful guardians—under penalty of repeated prosecutions, fines and imprisonment. I can only remind such that this was the course which was once tried in Leicester, when in one year (1881) there were no less than 1154 prosecutions under the Vaccination Acts! The result is now a matter of history, and it is to be feared that it will be many years yet before the mischief wrought by that mistaken policy has been repaired.

COMPENSATION TO "CONTACTS."

Full details of the procedure adopted in dealing with Smallpox cases in Leicester were given in my report on the 1903 epidemic, and it is unnecessary to repeat them here. I will merely refer to the question of granting compensation to "contacts" whom it is thought desirable to keep from attending work.

During the 1903 epidemic the total sum thus expended amounted to £195. During the epidemic of last year the amount was £177.

Further experience has confirmed me in the opinion that this money was well spent.

In the first place it cannot be regarded as desirable that persons who have been exposed to the infection of Smallpox should continue at work in a factory or workshop during the days when the onset of the disease is to be expected. It has been suggested that if "contacts" are visited daily during this critical period it is sufficient. My experience does not endorse this. The early symptoms of Smallpox often resemble those of an ordinary "chill," and, "the wish being father to the thought," "contacts" readily make themselves believe that these symptoms do not indicate anything serious. They are apt, therefore, to deny the fact that there is anything amiss with them, in the hope that it will soon pass off. Moreover, it may happen that a person who feels quite well when visited by the Inspector sickens before the day is out, and whilst he is still at work. Here again there is a great temptation to wait until the day's work is over.

On the other hand, if a "contact" is not at work, but is out for a walk (and we do not prohibit this), the natural tendency on beginning to feel ill is to go home at once in accordance with the instructions received.

The fact that the Sanitary Authority is paying compensation affords a most useful lever, and commands an obedience to orders which probably could not be equally secured in any other way It tends, moreover, to prevent concealment and deception.

The cost of compensation is not a very serious item in proportion to the total cost of a Smallpox epidemic; and it must be remembered that if "compensation" were not given by the Sanitary Authority many of the families in infected households would have to come upon the rates (through the Guardians) in any case, as it frequently happens that employers decline to have "contacts" back at work.

In Leicester it has been our practice to make a considerable distinction between what we call "inside" and "outside" contacts, *i.e.*, between those who have actually lived in the same house as a person attacked with Smallpox, and those who have only come into chance and transitory contact outside. With the latter each case is treated on its merits, and frequently it is not thought necessary to stop from work.

THE ROYAL COMMISSION ON VACCINATION AND THE "LEICESTER METHOD."

It does not appear to be generally recognised that the finding of the Royal Commission was distinctly favourable to the "Leicester Method." With the twelve years' further experience which has since been obtained it is probable that their report would have been even more favourable.

As the Reports of the Royal Commission are not readily accessible, I venture to quote the following extracts from their Final Report.

"The experience of Leicester affords cogent evidence that "the vigilant and prompt application of isolation, etc., even with "the defects which were brought to light during the recent "epidemic (1892-3), is a most powerful agent in limiting the "spread of Smallpox." (Section 486.)

"We think that a complete system of notification of the "disease, accompanied by an immediate hospital isolation of the "persons attacked, together with careful supervision, or, if "possible, isolation for sixteen days of those who had been in "immediate contact with them, could not but be of very high "value in diminishing the prevalence of Smallpox. . . . . . ." (Section 499.)

The following extracts must be read in the light of the experience of Leicester since the R.C.V. Report was written:—

"When we turn to the other branch of the inquiry, how far "such means could be relied on in the place of vaccination, we "find ourselves involved in questions of a much more complicated nature. We have little or no experience to fall back "upon. The experiment has never been tried. The nearest "approach to it has probably been in Australia. But even in "the parts of that country to which we have alluded the "population has not been entirely unvaccinated, though there "has been a large unvaccinated class amongst it. . . . . . " (Section 500).

" . . . . Who can possibly say that if the disease once "entered a town, the population of which was entirely or almost "entirely unprotected, it would not spread with a rapidity of "which we have in recent times had no experience, or who can "tell what call might then be made on hospital accommodation "if all those attacked by the disease were to be isolated? "*A priori* reasoning on such a question is of little or no value." (Section 502.)

"We can see nothing, then, to warrant the conclusion that "in this country vaccination might safely be abandoned, and "replaced by a system of isolation. If such a change were made "in our method of dealing with Smallpox, and that which had "been substituted for vaccination proved ineffectual to prevent "the spread of the disease (it is not suggested that it could "diminish its severity in those attacked), it is impossible to 'contemplate the consequences without dismay." (Section 503.)

The next extract marks the approval of the Royal Commission of one of the special features of the "Leicester Method."

"Power should, in our opinion, be conferred on Sanitary "Authorities to give compensation for loss of wages, and "generally for expenses occasioned either by the isolation of "patients, or persons who have come in contact with them, or "such supervision of them as is necessary, whether in hospital or "elsewhere." (Section 506.)

As in some quarters there is a tendency to deny that sanitation has played any part in the reduction of Smallpox mortality, the whole of such reduction being ascribed to the introduction of vaccination, it may be well to quote the Royal Commission on this point also.

"We have already pointed out that on *a priori* ground it is "reasonable to think that improved sanitary conditions would "tend to diminish the fatality of, and so to a corresponding "extent the mortality from, Smallpox. And there can be little "doubt that the period with which we are dealing has been "characterised by an improvement of this description. There "has been better drainage, a supply of pure water, and in other "respects more wholesome conditions have prevailed."

The experience of Leicester certainly confirms this view. Leicester, judging from its low general death-rate, may fairly claim to be a sanitary town, and the fatality of each of the three epidemics which have occurred in the last 30 years has been remarkably low.

Curiously enough the general death-rates for Leicester in the last two years, 1903 and 1904, during which Smallpox has been epidemic, have been the lowest on record, viz., 13·9 and 14·5 per 1000.

DR. PRIESTLEY'S OPINION.

Dr. J. Priestley, Medical Officer of Health for Leicester at the time of the 1892-3 epidemic, and now Medical Officer of Health for Lambeth, in his report on the epidemic of Smallpox in Lambeth in 1901-2, expresses an opinion which may reasonably be taken as applicable to the "Leicester Method." He writes as follows (page 26):—

"What has to be realised to-day, however, is that a Sanitary "Authority must be prepared to fight an epidemic of Smallpox "without too much reliance upon vaccination and re-vaccination. "It is an uphill fight, but that it can be done will be admitted "after a perusal of this report."

"It is unfortunate that it has to be done, as compulsory "vaccination and re-vaccination rapidly stamp out Smallpox, "though the days of compulsion in any shape or form are "rapidly passing away, and the action of the future must be "based on non-compulsion, at least as far as vaccination and re-vaccination are concerned."

Dr. Priestley evidently does not think that the Re-vaccination Bill, now before Parliament, has very much chance of being passed into Law.

A WORD OF WARNING.

It must not be forgotten that a large town like Leicester, possessing a fairly complete sanitary organisation, and prepared to deal very energetically with Smallpox whenever the disease may make its appearance, is in a very different position from many smaller communities possessing little or nothing in the way of sanitary organisation.

It is pitiable to see such communities copying Leicester as regards abandonment of infantile vaccination, but without preparing for any alternative method of controlling the disease, or at least doing so in a quite inadequate manner.

Leicester has succeeded in the past not *because* she has abandoned infantile vaccination, but *in spite* of having done so, and owing, as I believe, to the vigorous manner in which she has grappled with Smallpox in other ways.

It is probable that this fact is not fully appreciated everywhere, and for this reason the example of Leicester may be dangerous. I think it is probable that the sanitary organisation of many parts of the country is still in so primitive a condition that any attempt to adopt the "Leicester Method" to the extent of abandoning universal vaccination would be fraught with great danger.

Lastly, in order to prevent any misunderstanding, let me point out that in Leicester, although the masses of the people disbelieve in vaccination, the responsible officials who have had to fight Smallpox at close quarters have always had unbounded faith in the protective power of vaccination, and have not hesitated to avail themselves of its aid when necessary.

CONCLUSION.

Let me sum up the drift of Part III. of this Report as follows:—

I believe absolutely in the protective power of vaccination, but I think it possible

(*a*) That the importance of universal vaccination has been over-estimated:

(*b*) That the draw-backs and objections to vaccination have been under-estimated:

(*c*) That the terrors of Smallpox (by some and in someways) have been over-estimated:

(*d*) That the efficacy of modern preventive measures has been under-estimated: and

(*e*) That to attempt to force vaccination upon people against their convictions is unnecessary and unwise.

TABLE A.—Age Distribution of Smallpox Cases and Deaths.

CASES.

Age Period.	Under 1 year.	1 to 5	5 to 10	10 to 15	15 to 20	20 to 30	30 to 40	40 to 50	50 to 60	Over 60.	Total.
Vaccinated ...	...	...	...	...	4	34	49	26	9	5	127
Unvaccinated ...	6	23	43	53	41	19	5	1	...	1	192
Uncertain ...	...	...	...	...	1	1	...	...	...	...	2
Total ...	6	23	43	53	46	54	54	27	9	6	321

Table A.—Continued.

DEATHS.

Age Period.	Under 1 year.	1 to 5	5 to 10	10 to 15	15 to 20	20 to 30	30 to 40	40 to 50	50 to 60	Over 60	Total.
Vaccinated ...	...	...	...	...	...	...	...	1	...	...	1
Unvaccinated ...	1	...	2	...	...	...	...	...	...	...	3
Uncertain ...	...	...	...	...	...	...	...	...	...	...	...
Total ...	1	...	2	...	...	...	...	1	...	...	4

TABLE B.

List of Cases Vaccinated (or Re-vaccinated) in the Incubation Period.

Register Number.	Initials of Patients.	Age.	Vaccinal condition before exposure to infection.		Date of Vaccination after exposure.	Date of first appearance of Smallpox Eruption.	Interval between Vaccination and appearance of Smallpox.	Remarks
			Vaccinated.	Unvaccinated				
43	K.S.	11		x	Feb. 26	Mar. 5	7 days	Very mild case.
45	L.C.	9		x	„ 26	„ 6	8 „	Very mild case. Less than 100 spots.
46	R.K.	26	x		„ 27	„ 7	8 „	Mild case.
79	M.G.	13		x	Mar. 21	„ 28	7 „	Very mild case. Less than 100 spots.
80	E.G.	6		x	„ 21	„ 29	8 „	Very mild case.
93	K.G.	3		x	„ 21	„ 30	9 „	Thick discrete case.
92	J.G.	4		x	„ 21	„ 30	9 „	Trifling case. Only 12 spots.
85	B.B.	6		x	„ 24	„ 30	6 „	Very mild case.
104	H.B.	8		x	„ 24	April 1	8 „	Very mild case. Less than 100 spots.
105	E.B.	1		x	„ 24	„ 1	8 „	Trifling case. 12 spots.

109	F.G.	11 mos.		x	,, 21	,, 31	10 ,,	Trifling case. 12 spots.
161	E.V.	16		x	,, 4	,, 13	9 ,,	Coherent.
176	S.J.	9		x	,, 10	,, 19	9 ,,	Very mild case. Less than 100 spots.
185	S.F.	11		x	,, 19	,, 23	4 ,,	Coherent.
186	E.L.	11		x	,, 14	,, 24	10 ,,	Discrete.
199	M.G.	4		x	,, 26	,, 28	2 ,,	Discrete.
200	A.G.	33	x		,, 26	,, 28	2 ,,	Trifling case. Less than 50 spots.
214	A.G.	7		x	,, 26	May 7	11 ,,	Trifling case. Only 6 spots.
248	A.P.	38	x		May 17	,, 23	6 ,,	Trifling case. Only 5 spots.
280	S.C.	14		x	June 2	June 11	9 ,,	Discrete.
282	M.C.	4			,, 2	,, 13	11 ,,	Trifling case. 12 spots.
281	R.C.	39	x		,, 2	,, 13	11 ,,	Trifling case. 8 spots.
284	F.L.	16		x	,, 6	,, 15	9 ,,	Trifling case. Less than 100 spots.
286	S.D.	7		x	,, 7	,, 17	10 ,,	Trifling case. Less than 100 spots.
300	E.G.	5 mos.		x	July 7	,, 18	11 ,,	Trifling case. Only 25 spots.

TABLE C.

List of Cases in which the Infection is believed to have been Imported.

Date.	Initials of Patients.	Age.	Remarks.
Dec., 1903	J.W.	37	Lodging-house Keeper.
	J.T.	34	Tramp in Lodging-house.
	A.C.	20	Painter. Probably infected near Nottingham.
Jan., 1904	Mrs. R.	35	Tramp. Infected in Loughborough.
	Mr. R.	31	Tramp. Infected in Loughborough.
Feb., ..	E.S.	1	Grandchild of Gipsy. Infected in Loughborough.
	J.B.	23	Dealer. Infected in Loughborough.
	Amy K.	20	Tramp. Probably infected in Birmingham.
March ..	E.H.	22	Thought to have been infected by Tramp.
May ..	Mary C.	5	*Fatal case.* Child of Tramp. Probably infected near Burton-on-Trent.

TABLE D.

Showing number of cases of Smallpox occurring each week during the Epidemic of 1903 (illustrated in Chart I.)

Week ending.	Cases occuring.	Week ending.	Cases occurring.
1902.			
Dec. 25	2	June 18	2
1903.		„ 25	1
Jan. 1	0	July 2	3
„ 8	10	„ 9	3
„ 15	18	„ 16	0
„ 22	22	„ 23	2
„ 29	13	„ 30	2
Feb. 5	7	Aug. 6	7
„ 12	4	„ 13	2
„ 19	5	„ 20	2
„ 26	8	„ 27	1
Mar. 5	5	Sept. 3	1
„ 12	5	„ 10	1
„ 19	10	„ 17	10
„ 26	6	„ 24	10
April 2	9	Oct. 1	1
„ 9	1	„ 8	1
„ 16	6	„ 15	0
„ 23	53	„ 22	3
„ 30	21	„ 29	2
May 7	37	Nov. 5	1
„ 14	46	„ 12	0
„ 21	23	„ 19	0
„ 28	14	„ 26	0
June 4	10		
„ 11	4		394

TABLE E.

Showing number of cases of Smallpox occurring each week during the Epidemic of 1904.

Week ending.	Cases occurring.	Week ending.	Cases occurring.
1903.			
Dec. 10 ...	... 4	April 14 ...	... 28
,, 17 ...	... 0	,, 21 ...	.. 15
,, 24 ...	... 9	,, 28 ...	... 15
,, 31 ...	... 1	May 5 ...	... 12
1904.		,, 12 ...	... 13
Jan. 7 ...	... 1	,, 19 ...	... 21
,, 14 ...	... 1	,, 26 ...	... 5
,, 21 ...	... 3	June 2 ...	... 15
,, 28 ...	.. 4	,, 9 ...	... 15
Feb. 4 ...	... 8	,, 16 ...	... 5
,, 11 ...	... 9	,, 23 ...	... 8
,, 18 ...	... 4	,, 30 ...	... 0
,, 25 ...	... 5	July 7 ...	... 4
Mar. 3 ...	... 7	,, 14 ...	... 0
,, 10 ...	... 6	,, 21 ...	... 6
,, 17 ...	... 7	,, 28 ...	... 0
,, 24 ...	... 6	Aug. 4 ..	... 4
,, 31 ...	... 39	,, 11 ..	... 1
April 7 ...	... 33		321

TABLE F.

GIVING BRIEF PARTICULARS OF EACH CASE OF SMALLPOX OCCURRING DURING THE EPIDEMIC.

TABLE F.—Particulars of each Case of Smallpox occurring during the Epidemic.

No.	Name.	Age.	Sex.	Occupation.	Vaccinal Condition. Vacc.	Vaccinal Condition. Un-vacc.	Type of Disease.	Days in Hosp	Result.	Remarks.
							CASES OCCURRING IN DEC., 1903.			
393	A.W.	36	F	Housewife		x	Coherent	46		
394	M.W.	7	F	School		x	Coherent	16		
395	E.W.	12	F	,,		x	Confluent, very severe	63		
396	J.H.W.	37	M	Lodg. H. Keeper	x		No eruption	..		Unrecognised case, not removed.
397	W.M.	14	M	School		x	Confluent	46		
398	J.M.	14	M	,,		x	Coherent	45		
399	E.R.	11	F	,,		x	Confluent	45		
400	E.S.	13	F	,,		x	Coherent	45		
401	E.P.	12	M	,,		x	Discrete	24		
402	J.T.	34	M	Tramp	x		Confluent	53		
403	F.W.	1½	M	...		x	Mild discrete	26		
404	B.W.	14	F	School		x	Discrete	23		
405	E.P.	13	F	,,		x	Severe coherent	42		
406	A.C.	20	M	Printer		x	Discrete	35		
							BEGINNING OF YEAR 1904.			
1	J.S.	60	M	Workhouse	x		Discrete	41		
2	A.C.	22	F	Housewife		x	Mild discrete	26		
3	Mrs. R.	35	F	Tramp	x		No eruption	...		Unrecognised case, not removed.
4	J.O.	47	M	Lodg. H. bedmkr	x		Confluent	47		
5	F.M.	27	M	Lodg. H. inmate	x		Very mild discrete	17		
6	J.C.	51	M	,, ,,	x		Thick discrete	38		
7	T.R.	31	M	,, ,,	x		Thick discrete	26		
8	J.M.	57	M	,, ,,	x		Very mild discrete	19		
9	A.E.	27	M	,, ,,	x		Very mild discrete	20		
10	A.B.	48	M	,, ,,	x		Mild discrete	25		

11	F.S.	23	M	Lodg. H. inmate		x	Coherent	36		
12	W.W.	64	M	,, ,,	x		Mild discrete	19		
13	D.M.	15	F	Factory		x	Coherent	33		
14	G.R.	49	M	Marine Stores ...	x		Confluent	43		
15	H.K.	41	M	Lodg. H. inmate	x		Discrete...	42		
16	T.B.	64	M	,, ,,	x		,, ...	48		
17	B.G.	30	M	,, ,,	x		Mild discrete	21		
18	E.B.	32	M	Gas works ...		x	,, ,, ...	28		
19	J.T.	50	M	Lodg. H. inmate	x		,, ,, ...	22		
20	J.M.	49	M	,, ,,	x		Confluent	48		
21	E.G.H.	16	M	Publican ...		x	Mild discrete	20		
22	H.C.	49	M	Lodging House	x		Discrete...	23		
23	W.H.L	48	M	Factory... ..	x		Coherent	23		
24	T.S.	43	M	Lodging House	x		Mild discrete	22		
25	A.S.	35	M	,, ,,	x		,, ,, ...	26		
26	B.C.	53	M	,, ,,	x		,, ,, ...	27		
27	E.S.	1	F	... ...		x	Coherent	36		From gipsy caravan.
28	B.J.	23	M	General dealer ..		x	Mild discrete	27		
29	N.B.	67	F	Housewife ...		x	Coherent	45		Severe corneal ulcer
30	J.S.	14	M	School		x	Mild discrete	23		
31	A.E.H.	3	M	... ...		x	Discrete	27		
32	S.B.M.	23	M	Lodging House	?	?	Coherent	44		Vaccination uncertain.
33	H.B.	35	M	,, ,,	x		Mild discrete	29		
34	J.S.	27	M	Potman	x		,, ,, ...	23		
35	W.P.	37	M	Railway labourer	x		,, ,, ...	29		From Casual Ward at Workhouse.
36	A.C.	6	F	School		x	,, ,, ...	50		
37	J.S.	7	M	School		x	Very mild discrete ...	21		
38	A.K.	20	F	Tramp		x	Mild discrete	42		
39	W.B.	38	M	Factory	x		Very mild discrete ...	24		
40	G.P.	40	M	Gardener ...	x		Coherent	31		
41	E.H.	34	F	Housewife ...	x		Very mild discrete ...	17		Said to have had previous Smallpox [in childhood.
42	A.P.	45	M	Street cleanser...	x		,, ,, ,, ...	27		
43	K.S.	11	F	School		x	A few spots	24		Vaccinated during incubation period.

TABLE F.—Continued.

No.	Name.	Age.	Sex.	Occupation.	Vaccinal Condition.		Type of Disease.	Days in Hosp	Result.	Remarks.
					Vacc	Un-Vacc.				
44	W.B.	40	M	Lodging house	x		Confluent	10	Died.	See Notes about Vaccination in Text
45	L.C.	9	F	School		x	Less than 100 spots	37		Vaccinated in the incubation period.
46	R.K.	26	F	Tramp	x		Mild discrete	25		Re-vaccinated after patent was infected with Smallpox.
47	M.B.	27	F	Housewife		x	Severe discrete	39		
48	W.H.H.	37	M	Factory		x	Severe coherent	53		
49	A J.	19	F	Hawker		x	Severe discrete	53		Keratitis.
50	J.W.	30	M	Publican	x		Very mild discrete	20		
51	T.W.	39	M	Factory	x		,, ,, ,,	19		
52	H.S.	4	M	School		x	Coherent	46		
53	E.B.	15	M	Tailor		x	,,			
54	H.B.	12	F	School		x	Discrete	30		
55	J.B.	43	M	Carpenter	x		,,	33		
56	F.H.	40	M	Ironfounder	x		12 spots	19		
57	T.M.	64	M	...	x		Coherent	26		Aborted.
58	J.W.G.	15	M	School		x	Very mild discrete	26		Epilepsy.
59	G.G.	8	F	,,		x	Mild discrete	26		
60	A.B.	6	F	,,		x	18 spots	18		
61	W.C	36	M	Factory		x	Severe confluent	38		
62	J.C.	35	M	Picture dealer	x		Discrete	22		
63	H.D.	40	F	Housewife	x		Very mild discrete	22		
64	W.W.	25	M	Factory	x		Less than 100 spots	21		
65	H.P.	17	M	,,		x	Confluent			Abscesses.
66	R.S.	15	F	,,		x	Coherent	46		Abscess.
67	T.W.B	33	M	Manufacturer	x		Less than 100 spots	18		
68	G H.	23	F	Factory		x	Coherent	25		
69	A.N.	22	F	,,	x		...			Unrecognised case, not removed.
70	R.B.	19	F	,,		x	Severe discrete	30		
71	J.C.	20	M	Publican		x	Discrete	24		

72	J.Y.	28	M	... ...	x		Less than 100 spots ...	24	
73	E.Y.	20	F	Housewife ...		x	Mild diserete	45	
74	G.M.	35	M	Drayman ...	x		Less than 100 spots ...	20	
75	E.H.	22	M	Photographer ...		x	Confluent	51	Conjunctivitis.
76	A.H.	44	M	Fruiterer ...	x		Discrete	26	
77	F.D.	22	F	Domestic ...	x		... ...	33	
78	H.L.	23	M	Factory ...	x		Less than 100 spots ...	23	
79	M.A.G.	13	F	School		x	12 spots	23	Vaccinated during incubation period.
80	E.G.	6	F	,, ...		x	Very mild discrete ...	33	,, ,, ,, ,,
81	A.N.	11	F	,, ...		x	Coherent	36	
82	E.J.	25	F	Factory... ...	x		12 spots	18	
83	H.J.	21	F	,, ...	x		,, ...	18	
84	E.S.	25	M	Barber	x		Very mild discrete ..	18	
85	B.B.	4	F	... ...		x	,, ,, ,, ...	35	Vaccinated during incubation period.
86	G.B.	38	M	Factory... ...	x		.. ..		Unrecognised case, not removed.
87	A.B.	38	F	Housewife ...	x		... ...		,, ,, ,,
88	W.E.	29	M	Tramways ..	x		30 spots	21	
89	E.H.	52	F	Housekeeper ...	x		... .		Unrecognised case, not removed.
90	J B.	46	M	Gasworker ...	x		Discrete	24	
91	M.R.	12	F	School		x	,, ...	29	
92	J.G.	4	M	,, ...		x	12 spots	31	Vaccinated duriug incubation period.
93	K.G.	3	F	... ...		x	Severe discrete ...	35	,, ,, ,, ,,
94	G.W.G.	40	M	... ...	x		50 spots	30	
95	G.B.	9	M	School		x	Coherent	42	
96	W.N.	35	M	Gasworker ...	x		Discrete	30	
97	G.R.	7	F	School		x	,, ...	31	
98	M.E.	40	F	Laundry ...	x		,, ...	23	
99	H.C.	15	M	Clerk		x	Very mild discrete ...	30	
100	R.L.	24	M	,, ...	x		Less than 100 spots ...	24	
101	M.W.	7	F	School		x	Mild discrete	27	
102	A.C.	7	M	,, ...		x	Coherent		
103	W.S.	18	M	Sewage farm ...		x	Discrete	27	
104	H.B.	8	M	School		x	Less than 100 spots ...	23	Vaccinated in the incubation period.
105	E.B.	1	F	... ...		x	12 spots	19	,, ,, ,, ,,

TABLE F.—Continued.

No.	Name.	Age.	Sex.	Occupation.	Vaccinal Condition.		Type of Disease.	Days in Hosp	Result.	Remarks.
					Vacc	Un-vacc				
106	G.P.	39	M	Factory	x		Discrete	33		
107	G.D.	44	M	"	x		Less than 100 spots	18		
108	E.M.	12	M	School		x	Severe discrete	39		
109	F.G.	1	F	...		x	12 spots	17		Vaccinated in the incubation period.
110	F.K.	33	M	Factory	x		Abortive discrete	27		
111	P.H.	21	M	Publican		x	Severe discrete	27		
112	H.C.	32	M	Potman	x		...			Unrecognised case, not removed.
113	H.C.	9	M	School		x	Coherent	41		
114	F.W.C	2½	M	...		x	30 spots	17		
115	T.C.	1½	M	...		x	20 spots	17		
116	N.C.	19	F	Factory	x		Less than 100 spots	24		
117	E.C.	11	F	School		x	Discrete	27		
118	E.C.	15	F	Factory		x	Severe discrete	34		
119	D.C.	$\frac{5}{12}$	F	...		x	Discrete	24		
120	B.E.	32	F	Housewife	x		12 spots	23		
121	F.E.	8	F	School		x	Discrete	26		
122	H.S.	38	M	Factory	x		43 spots	16		
123	E.B.	10	M	School		x	Very mild discrete	28		
124	K.V.	3¾	F	...		x	Coherent	51		
125	J.Y.	$\frac{9}{12}$	M	...		x	"	36		
126	E.S.	24	F	Factory	x		...			Unrecognised case, not removed.
127	L.S.	18	F	"		x	Discrete	29		
128	A.S.	10	F	School		x	Coherent			
129	E.S.	52	F	Housewife	x		Discrete	43		
130	D.S.	15	F	Factory		x	"	29		
131	T.S.	11	M	School		x	Coherent			
132	W.S.	32	M	Factory	x		Abortive discrete	36		
133	S.T.	8	F	School		x	Hæmorrhagic	3	Died.	

134	L.B.	6	F	School		x	Discrete	26	
135	E.G.	5	M	,, ...		x	Confluent	47	
136	G.S.	33	M	Street pavior ...	x		Discrete	36	
137	A.C.	7	F	School		x	Coherent	39	
138	H.W.	38	M	Factory... ..	x		... ...		Unrecognised case, not removed.
139	E.W.	38	F	Housewife ...	x		Mild discrete	21	
140	H.W.	3	M	... ...		x	Discrete	25	
141	M.P.	35	F	Housewife ...	x		Less than 100 spots ...	21	
142	A.B.	36	M	Factory... ...	x		,, ,, ,, ...	22	
143	R.B.	42	M	,, ...	x		Coherent	39	Aborted.
144	E.H.	22	F	,, ...	x		35 spots...	38	Miscarriage.
145	A.J.	6	M	School		x	Discrete...	31	
146	E.E.	10	F	School		x	Coherent	38	
147	W.F.	39	M	Factory... ...	x		Less than 100 spots ...	24	
148	F.M.	26	F	,, ...	x		2 spots	12	Prodromal rash.
149	E.R.	44	F	Boarding house	x		Mild discrete	40	Kerutitis.
150	J.E.S.	27	M	Asbestos worker		x	Coherent	33	
151	E.S.	52	F	Housewife ...	x		Abortive coherent ...	67	Conjunctivitis.
152	A.W.	29	F	Charwoman ..	x		Discrete	27	Miscarriage.
153	W.P.	17	M	Factory... ...		x	,, ...	26	
154	A.C.	18	F	,, ...	?	?	Less than 100 spots ..	25	Vaccination uncertain.
155	L.O.	19	F	... ...		x	Confluent	43	
156	D.F.	10	M	School		x	Severe discrete ...	14	
157	E.F.	12	F	,, ...		x	Mild discrete	28	
158	A.F.	8	M	,, ...		x	,, ,, ...	28	
159	G.G.	17	M	Factory... ...		x	Discrete	42	Conjunctivitis.
160	A.D.	2	F	... ...		x	67 spots...	23	
161	E.V.	16	F	Factory		x	Coherent	31	Vaccinated in incubation period.
162	F.D.	25	F	Housewife ...	x		... ...		Unrecognised case, not removed.
163	T.E.L.	1½	M	... ...		x	Severe discrete ...	33	
164	E.B.	21	F	Factory... ...	x		12 spots	18	
165	T.G.	35	M	Plumber ...	x		Abortive discrete ...	34	
166	H.B.	16	M	... .		x	Discrete	27	

TABLE F.—Continued.

No.	Name.	Age.	Sex.	Occupation.	Vaccinal Condition.		Type of Disease.	Days in Hosp	Result.	Remarks.
					Vacc.	Un-vacc				
167	T.B.	13	M	School		x	Coherent	39		
168	W.B.	11	M	,,		x	,,	45		
169	E.B.	6	M	,,		x	64 spots	27		
170	E.B.	18	F	Factory		x	Mild discrete	26		
171	F.B.	3	M	,,		x	43 spots	26		
172	H.W.	10	F	School		x	Discrete	29		
173	Mrs. S.	49	F	Housewife	x		Mild discrete	21		
174	J.L.	27	M	Factory	x		Less than 100 spots	22		
175	E.M.	35	M	Publican	x		Abortive discrete	24		
176	S.A.J.	9	F	School		x	Less than 100 spots	24		Vaccinated in the incubation period.
177	A.G.	32	M	Factory	x		,, ,,	22		
178	E.M.	37	F	Housewife	x		Less than 100 spots	22		
179	W B.	65	M	Factory	x		Confluent	57		
180	P.P.	13	M	School		x	,,	47		
181	G.K.	16d.	F	,,		x	Coherent	29		
182	S.A.P.	27	F	Housewife	x		Less than 100 spots	25		
183	F.N.	11	M	School		x	Severe discrete	39		
184	W.P.	47	M	Factory	x		Less than 100 spots	20		
185	S.F.	10	M	School		x	Coherent	32		Vaccinated during incubation period.
186	E.L.	11	F	,,		x	Discrete	31		
187	T.K.	2½	M			x	Coherent	51		
188	F.W.	19	F	Factory	x		31 spots	19		
189	G.P.	32	F	Monthly nurse	x		Mild discrete	23		
190	M.S.P.	15	F			x	Coherent	30		[from severe attack 20 years ago.
191	T.P.	38	M			x	No eruption			Unrecognised case, not remv'd, suffered
192	Mrs. D.	20	F	Factory	x		Six spots only			Unrecognised case, not removed.
193	W.G.	34	M	Bootmaker	x		Discrete	22		
194	J.T.L.	36	M	Factory	x		Three spots	22		Prodomal rash.

195	C.C.	13	M	School ...		x	Coherent	55		
196	J.H.	25	M	Innkeeper	x		Less than 100 spots	21		
197	W.C.	10	M	School ...		x	Coherent	28		
198	E.L.	31	F	Factory...	x		30 spots...	21		
199	M.G.	4	F	School ...		x	Discrete	43		Vaccinated in the incubation period.
200	A.G.	33	F	Housewife	x		Less than 50 spots	26		Revaccinated after being infected with [Smallpox.
201	G.H.	25	M	Factory...	x		Less than 100 spots	21		
202	J.R.	40	M	,,		x	Confluent	43		
203	A.E.C.	3	F	...		x	Very mild discrete	43		
204	E.L.	16	F	Factory...		x	Confluent	49		
205	S.S.	50	M	,,	x		About 20 spots...			Unrecognised case, not removed.
206	T.B.	30	M	Barber ...	x		Less than 100 spots	21		
207	A.B.	14	M	School ...		x	Severe discrete...	26		
208	E.P.	20	F	Factory...		x	67 spots...	25		
209	J.H.	5 w.	M	...		x	Coherent	6	Died.	
210	G.S.	12	M	School .		x	Severe Discrete	22		
211	E.P.	5	F	,,		x	Coherent	28		
212	E.P.	2¾	F	...		x	,,	49		
213	C.K.	7	M	School ...		x	Discrete	24		
214	A.G.	7	M	,,		x	Six spots	13		Vaccinated in incubation period.
215	R.B.	8	F	,,		x	Mild coherent	54		
216	S.D.	5	M	,,		x	Discrete	26		
217	E.F.	10	M	,,		x	Coherent	46		
218	W.S.	15	M	Factory...		x	Confluent	50		
219	F.S.	7	M	School ..		x	Coherent	35		
220	M.C.	5	M	,,		x	Confluent	18	Died.	
221	A.P.	15	F	Co-op. stores		x	Coherent	48		
222	A.C.	32	F	Housewife	x		Discrete	30		
223	N.B.	10	F	School ...		x	Coherent	55		
224	F.S.	14	M	Ironmonger		x	,,	35		
225	W.S.	9	M	School ...		x	,,	32		
226	E.A.T.	37	F	Housewife	x		One spot	14		
227	G.H.T.	7	M	School ...		x	Discrete	14		

TABLE F.—Continued.

No.	Name.	Age.	Sex.	Occupation.	Vaccinal Condition. Vacc.	Vaccinal Condition. Un-vacc.	Type of Disease.	Days in Hosp	Result.	Remarks.
228	J.A.T.	36	M	Factory...	x		Discrete	21		
229	J.P.T.	5	M	School ...		x	Coherent	39		
230	A.J.T.	13	M	,,		x	Discrete	28		
231	W.W.T.	10	M	,,		x	Coherent	28		
232	A.E.T.	2½	M	...		x	Severe Discrete	46		
233	E.M.T.	15	F	Factory...		x	Discrete	25		
234	E.P.	29	M	,,	x		20 spots	17		
235	T.T.	43	M	Odd jobs	x		Less than 50 spots	20		
236	H.K.	12	M	School ...		x	Coherent	38		
237	A.C.	6	M	,,		x	Mild Discrete	37		
238	M.K.	10	F	,,		x	Coherent	37		
239	E.W.	14	F	Factory..		x	Discrete	37		
240	T.K.	36	M	Coal dealer	x		Abortive coherent	32		
241	G.K.	5	F	School ...		x	Discrete	32		
242	H.D.	13	M	,,		x	,,	36		
243	A.D.	25	F	Housewife	x		Two spots	18		
244	E.B.	19	F	...	x		,, ,,	18		
245	G.S.	24	M	...		x	Confluent	53		Boils.
246	J.A.	31	M	Grocer ...	x		Discrete	19		
247	G.C.	18	F	Factory...		x	Coherent	33		
248	A.P.	37	F	Housewife	x		Five spots	11		Re-vaccinated during incubation period.
249	F.N.	18	F	Factory...		x	Discrete	28		
250	J.W.	24	M	,,	x		Less than 100 spots	19		
251	J.T.B.	20	M	,,	x		,, ,, ,,	19		
252	E.C.	26	F	,,	x		,, ,, ,,	26		
253	W.T.	23	M	,,	x		12 spots	18		
254	J.C.	15	F	,,	x		85 spots	21		
255	G.H.	12	M	School ...		x	Discrete	40		

256	A.M.	25	M	Factory...	x		Discrete ...	19	
257	E.W.	22	F	Housewife ...		x	,, ...	36	
258	E.B.	17	F	Factory...		x	Coherent ...	36	
259	A.J.	7	M	School ...		x	Discrete ...	32	
260	W.R.	18	M	Factory...		x	Confluent ...	43	
261	E.H.	16	F	,, ...		x	Coherent ...	31	
262	F.O.	16	F	,, ...		x	Discrete ...	36	
263	E.C.	$2\frac{1}{2}$	F	... ...		x	,, ...	41	
264	E.G.	21	M	Factory...		x	,, ...	27	Corneal ulcer.
265	M.T.	44	F	Housewife ...	x		23 spots ...	15	
266	E.T.	9	F	School ...		x	Very mild discrete ..	22	
267	L.N.	15	F	Factory...		x	Coherent ...	47	
268	J.T.	47	M	,, ...	x		Discrete ...	19	
269	R.N.	17	F	,, ...		x	Coherent ...	36	
270	M.W.	16	F	,, ...		x	Discrete ...	25	
271	J.L.	14	F	,, ...		x	Confluent ...	49	
272	T.W.L.	10	M	School ...		x	20 spots ...	34	
273	J.D.	8	F	,, ...		x	Very mild discrete ...	22	
274	E.W.	17	F	Factory...		x	Coherent ...	44	
275	H.W.	10	M	School ...		x	,, ...	34	Conjunctivitis.
276	T.W.	15	M	Factory...		x	,, ...	48	
277	A.W.	3	M	... ...		x	Very mild discrete ...	23	
278	E.W.	35	F	Housewife ...	x		... ...		Unrecognised case, not removed.
279	A.H.R.	42	M	Factory...	x		Less than 100 spots ...	20	
280	S.C.	14	F	,, ...		x	Discrete... ...	40	Vaccinated in the incubation period.
281	R.C.	39	F	Housewife ...	x		8 spots	19	,, ,, ,, ,,
282	M.C.	4	F	School ...		x	12 spots... ...	19	,, ,, ,, ,,
283	E.W.	15	F	Factory...		x	Discrete... ...	40	
284	F.L.	15	M	Tramways ...		x	Less than 100 spots ..	24	Vaccinated in the incubation period.
285	J.S.	7	M	School ...		x	Discrete... ...	40	
286	S.D.	7	M	,, ...		x	55 spots... ...	26	Vaccinated in the incubation period.
287	J.L.	12	M	,, ...		x	Discrete ...	39	
288	P.M.	10	M	,, ...		x	Coherent ...	39	

TABLE F.—Continued.

No.	Name.	Age.	Sex.	Occupation.	Vaccinal Condition. Vacc.	Vaccinal Condition. Un-vacc.	Type of Disease.	Days in Hosp	Result.	Remarks.
289	E.H.	16	F	Factory... ..		x	Discrete	24		
290	A.T.	7	M	School		x	,, ...	38		
291	M.L.	23	F	Housewife ...		x	Coherent	26		
292	N.D.	21	F	Factory... ..		x	,, ...	31		
293	F.L.	12	M	School		x	97 spots...	25		
294	L.G.	30	F	,, ...	x		confluent	31		
295	J.W.	6	M	,, ...		x	Severe discrete... .	30		
296	R.W.	12	M	,, ...		x	,, ,, ...	30		
297	S.M.	10	M	,, ...		x	Coherent	37		Haematuria
298	N.G.	10	F	,, ...		x	,, ...	30		
299	C.G.	14	F	Factory... ...		x	Discrete...	22		
300	E.G.	4 m.	F	... ...		x	25 spots...	19		Vaccinated in the incubation period
301	G.B.	4	M	... ...		x	Very mild discrete ...	24		
302	H.B.	20	M	Carpenter ...		x	Coherent	28		
303	F.B.	15	M	Clerk		x	Severe discrete	33		Conjunctivitis
304	C.B.	48	M	Factory...	x		Mild discrete	24		
305	E.B.	18	F	,, ...		x	Severe discrete... ..	32		Conjunctivitis
306	C.B.	17	M	,, ...		x	... ...			Unrecognised case, not removed
307	K.B.	31	F	... ...	x		Abortive discrete ...	21		Doubtful case